CONTAX 159 MM

REPAIR MANUAL

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SPECIFICATIONS

Type	: 35㎜ single - lens reflex featuring Auto／Manual exposure modes and focal plane shutter.
Image Size	: 24×36㎜.
Lens Mount	: CONTAX／YASHICA bayonet mount.
Shutter	: Quartz－timed, electronically operated vertical travel metal focal plane shutter.
Shutter Speeds	: 1／4000 to 60 sec. in Auto mode; 1／4000 to 1 sec. (13 steps) in Manual mode, with "B".
Flash Synchronization	: Indirect X－synch only with dedicated flash unit; automatically synchs at 1／100 sec. in electronic flash mode at 1／250 sec. or slower (flash bulb synchs at 1／30 sec. or slower) in manual flash mode. X－synch terminal provided.
Self－Timer	: Quartz－timed electronic self－timer with 10 sec. delay. LED flashes during operation, accelerating 2 sec. before activation of shutter. Cancellable in mid－operation
Shutter Release	: Electromagnetic release system with dedicated release socket.
Exposure Modes	: (1) Normal Program AE mode; (2) High－speed Program AE mode; (3) Low－speed Program AE mode; (4) Aperture－priority AE mode; (5) Manual exposure mode; (6) TTL Program Auto Flash mode; (7) TTL Aperture－Priority Auto Flash mode; (8) Manual Flash mode.
Metering System	: TTL center－weighted metering at full aperture (direct TTL center－weighted metering when using TL A electronic flash system) via Silicon Photo Diode (SPD) cell. Metering range from EV 0 to 20 (f／1.4 lens, ISO 100). Film speed range from ISO 12 to 3200. Metering switch turned on by depressing shutter release button partway in, automatic cut off after 16 seconds.
AE Lock	: Exposure memory locking, EV compensating type with exposure compensation dial.
Exposure Compensation	: +2 to－2EV with／1／2－step click stops (intermediate setting).

Viewfinder	: Eye – level, pentaprism type with long eyepoint, Showing 95% of picture area at 0.82 × magnification using 50 mm lens set at infinity.
Focusing Screen	: Horizontal split – image / microprism collar screen as standard; interchangeable with four other types.
Viewfinder Display	: LED digital display indicating aperture and exposure compensation (+, –) signs; LED display indicating shutter speed (correct shutter speed, over and under exposure), program AE modes (P), dedicated flash mark; array indicating shutter speeds.
Film Advance	: Lever operated 135 - degree winding angle and 30 – degree stand – off angle; provision made for operation with Contax 159 Winder W–7.
Film Rewind	: By rewind crank after depressing film rewind release button.
Exposure Counter	: Auto resetting type; at all shutter settings except "B" (Bulb), camera shutter system automatically operates at 1/100 sec. until counter advances to "1".
Multiple Exposure	: Enabled by turning multiple exposure lever.
Accessory Shoe	: Direct X – synch hot – shoe with CONTAX TLA capability.
Camera Back	: Hinged type opened by pulling up on film rewind knob; memo holder provided; interchangeable with Data Back Quartz D–6.
Power Source	: Powered by two 1.55V silver oxide batteries (SR44) or 1.5V alkaline manganese batteries (LR44); provided with main switch.
Battery Check	: Indicated by battery check lamp activated by main switch operation.
Other Features	: Provided with couplings for motorized winder, LED for Data Back application, and depth – of – field preview button.
Size	: 138 (W) × 89 (H) × 55 (D) mm
Weight	: 520 grams (with out batteries).

1. DISASSEMBLING OF THE EXTERIOR PARTS.

(1) Top Cover;

Remove the respective parts ① ~ ⑳ shown in (Fig 1) in numerical order.

[Note for disassembling]

a) W.Lever Set Screw (159610) is counter clockwise screw.

b) Release Pin (159307)(Fig 2) easily falls off when the camera body is turned upside-down.

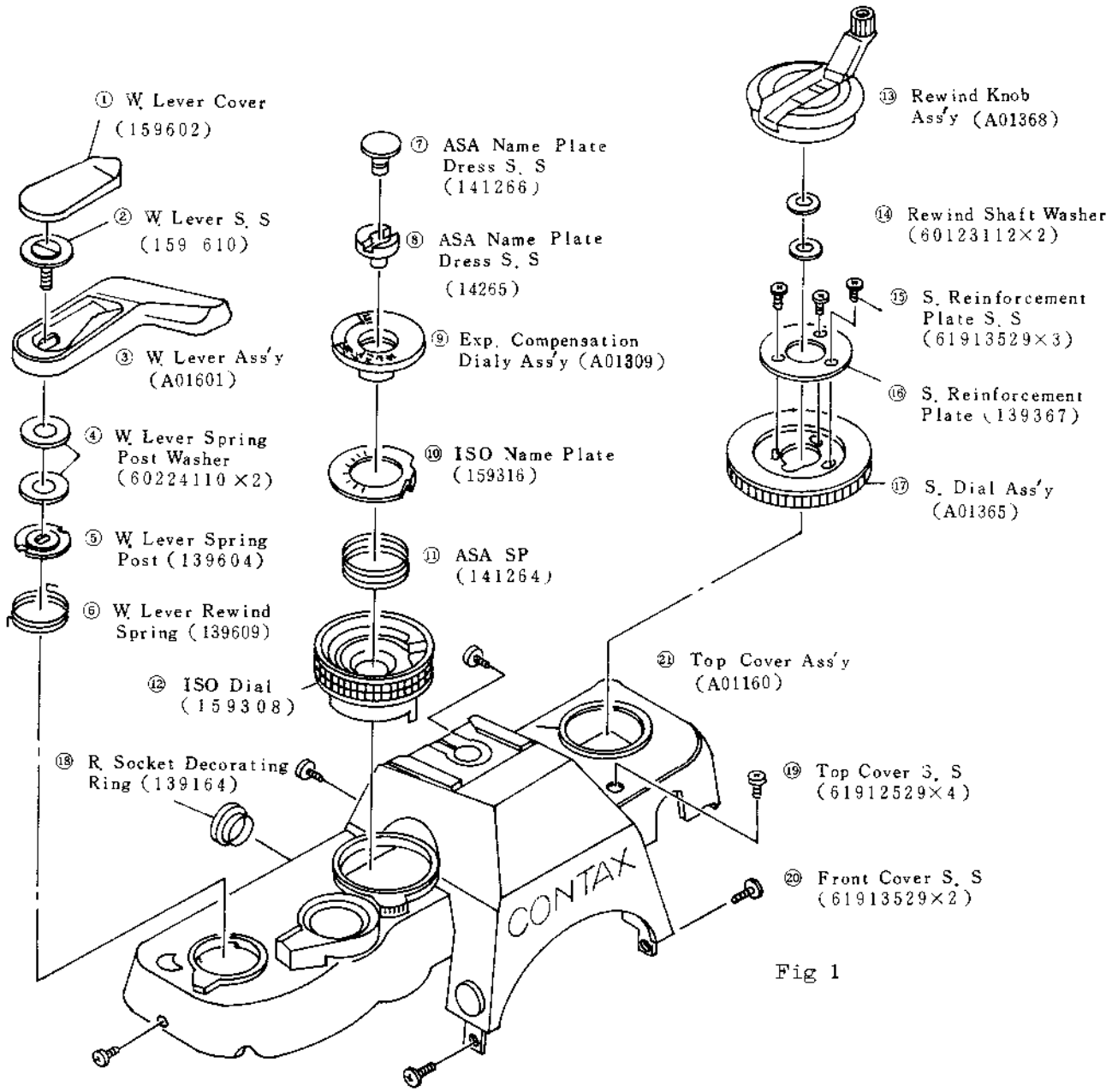

① W. Lever Cover (159602)
② W. Lever S. S (159 610)
③ W. Lever Ass'y (A01601)
④ W. Lever Spring Post Washer (60224110×2)
⑤ W. Lever Spring Post (139604)
⑥ W. Lever Rewind Spring (139609)
⑦ ASA Name Plate Dress S. S (141266)
⑧ ASA Name Plate Dress S. S (14265)
⑨ Exp. Compensation Dialy Ass'y (A01309)
⑩ ISO Name Plate (159316)
⑪ ASA SP (141264)
⑫ ISO Dial (159308)
⑬ Rewind Knob Ass'y (A01368)
⑭ Rewind Shaft Washer (60123112×2)
⑮ S. Reinforcement Plate S. S (61913529×3)
⑯ S. Reinforcement Plate (139367)
⑰ S. Dial Ass'y (A01365)
⑱ R. Socket Decorating Ring (139164)
⑲ Top Cover S. S (61912529×4)
⑳ Front Cover S. S (61913529×2)
㉑ Top Cover Ass'y (A01160)
CONTAX

Fig 1

〔Note for reassembling Top Cover Ass'y〕

a) Make sure the Release Pin (159307) is in position when reassembling.

b) When mounting the Top Cover Ass'y, the protrusion of Main Switch Driving Plate should engage into the cavity of Main Switch Plate (A01214) and the cavity of ME Lever (159663) should engage into the ME. Coupling Lever (159665) as shown in (Fig 2).

c) Make sure the ME Lever and Main Switch Lever function smoothly.

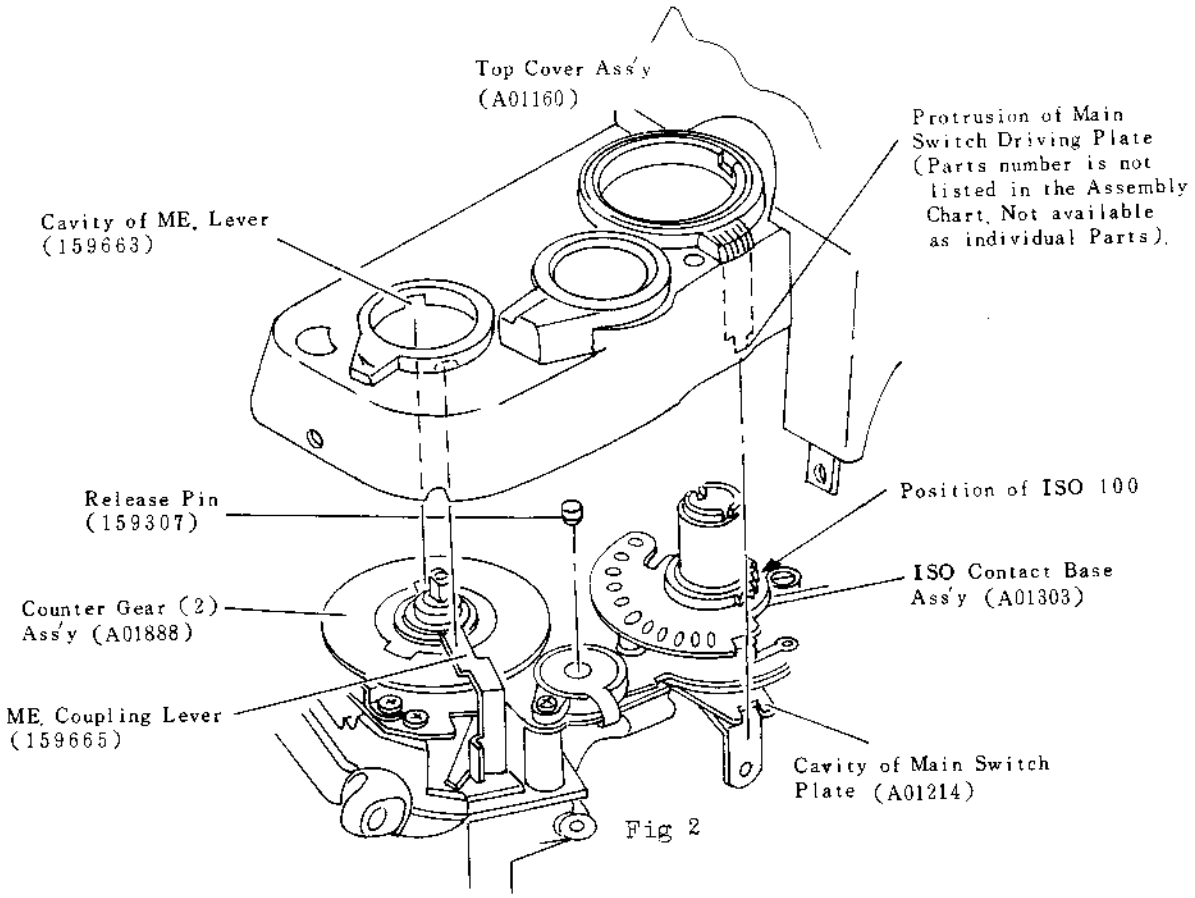

Top Cover Ass'y
(A01160)
Protrusion of Main Switch Driving Plate (Parts number is not listed in the Assembly Chart. Not available as individual Parts).
Cavity of ME. Lever
(159663)
Release Pin
(159307)
Position of ISO 100
ISO Contact Base Ass'y (A01303)
Counter Gear (2) Ass'y (A01888)
ME. Coupling Lever
(159665)
Cavity of Main Switch Plate (A01214)

Fig 2

〔Note for reassembling S. Dial Ass'y〕

a) Set the "P" position of Shutter Click Plate Ass'y (A01345) as shown in (Fig 3) and the "P" letter of S. Dial Ass'y (A01365) aligns with the Shutter Speed index mark.

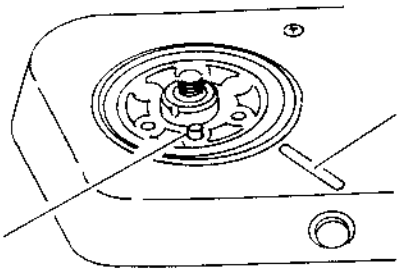


Fig 3

(2) Bottom Cover;

Remove the respective ① ~ ⑤ shown in (Fig 4) in numerical order.

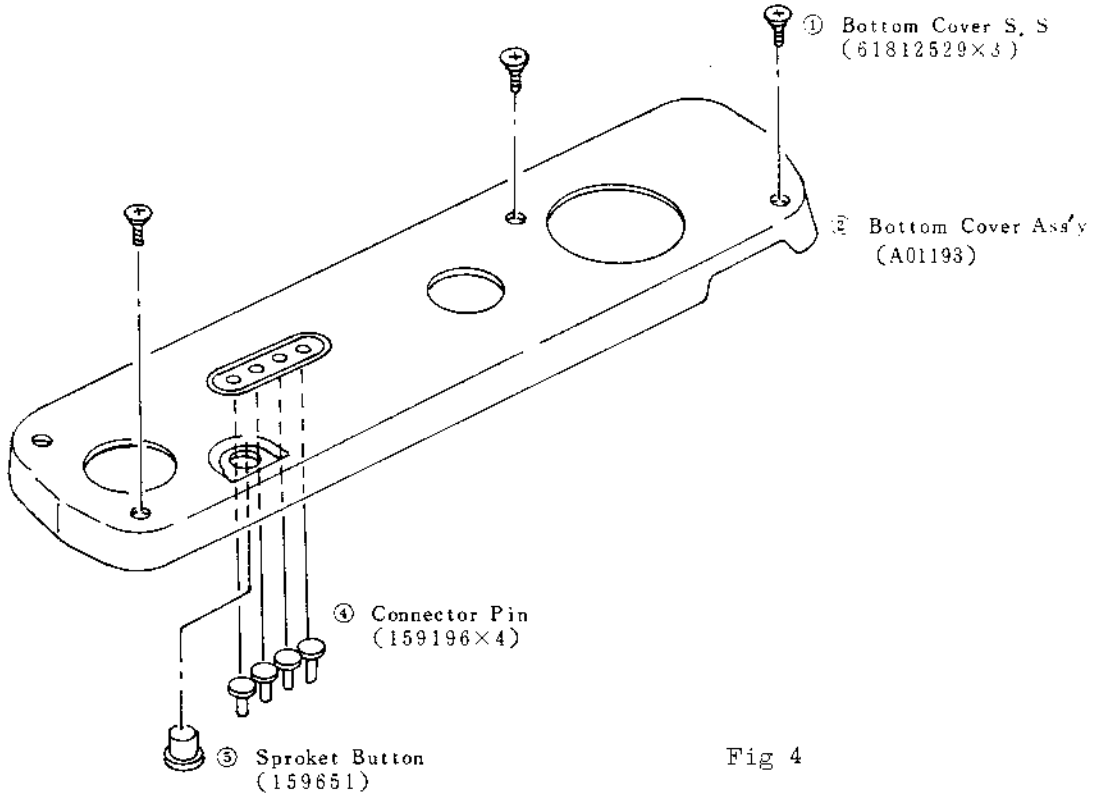


Fig 4

[Note for reassembling Bottom Cover]

a) Make sure four Connector Pin (159196×4) and Sproket Button (159651) are in position when reassembling.

(3) Grip Ass'y and Reinforcement Plate;

Remove the respective parts ① ~ ⑨ shown in (Fig 5) in numerical order.

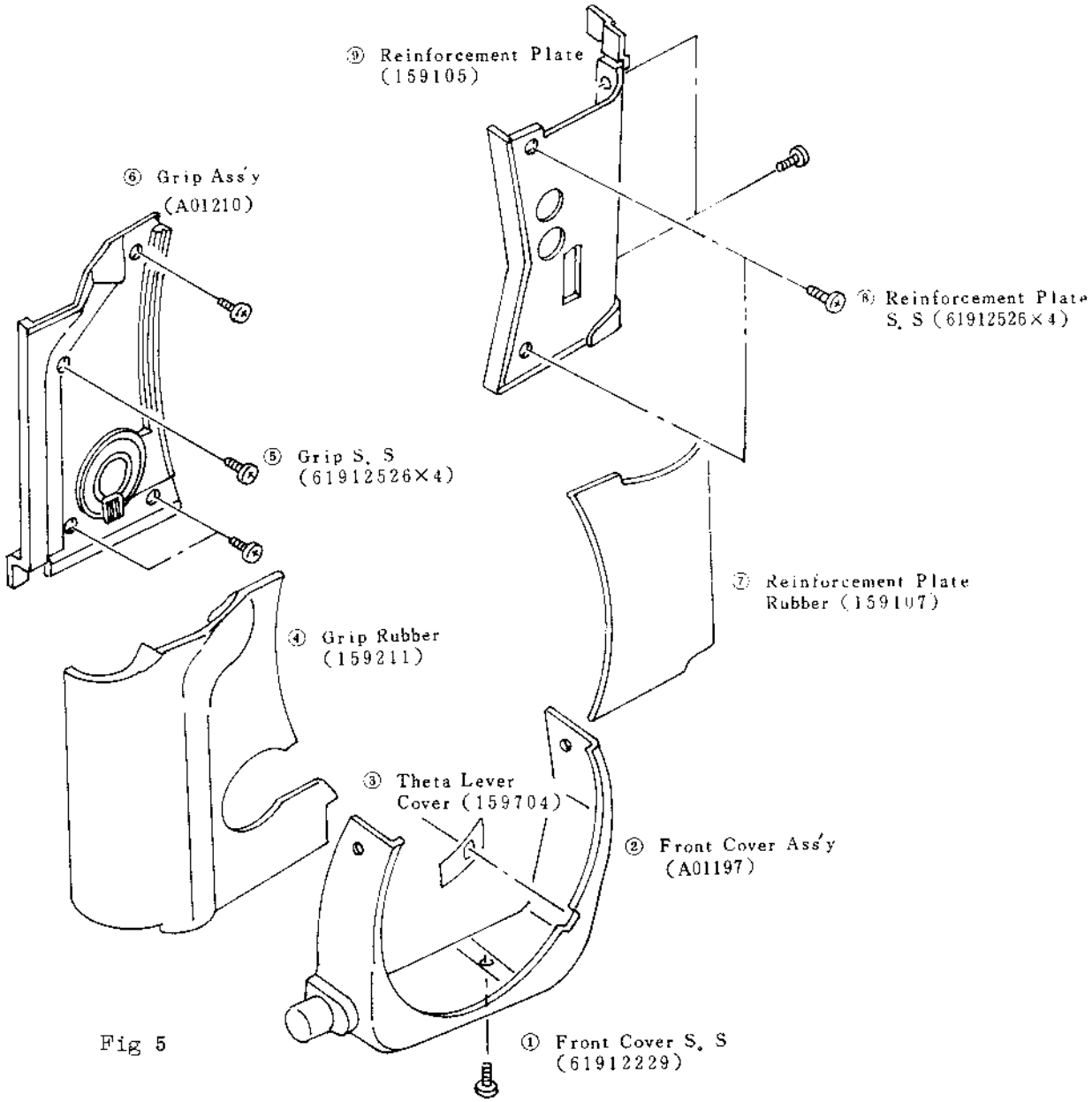

⑨ Reinforcement Plate (159105)
⑥ Grip Ass'y (A01210)
⑧ Reinforcement Plate S. S (61912526×4)
⑤ Grip S. S (61912526×4)
⑦ Reinforcement Plate Rubber (159107)
④ Grip Rubber (159211)
③ Theta Lever Cover (159704)
② Front Cover Ass'y (A01197)
① Front Cover S. S (61912229)

Fig 5

〔Note for reassembling Front Cover〕

a) Front Cover S.S (61912229) is shorter than Top Cover S.S (61912529) and if wrong screw is used, the program functions may not work properly.

〔Directions for attaching Rubbers〕

a) Clean the camera body surface where the Rubber is to be covered.

b) Mix 5 parts of Ever Grip adhesive 705H to 5 parts of Ketone and apply the mixture on to the camera body surface where the Rubber is to be covered and dry it for 1 ~ 2 minutes.

c) Apply the Ever Grip adhesive 705H on the reverse side of the Rubbers and attach them on to the camera body surface firmly.

2. DISASSEMBLING OF THE MIRROR BOX ASS'Y from the camera body. (W/AMP Ass'y and ISO Base Plate Ass'y)

a) Remove two FPC Fixer Sheet Set Screws (61912022×2), FPC Fixer Sheet (159596) and FPC Support (107616).

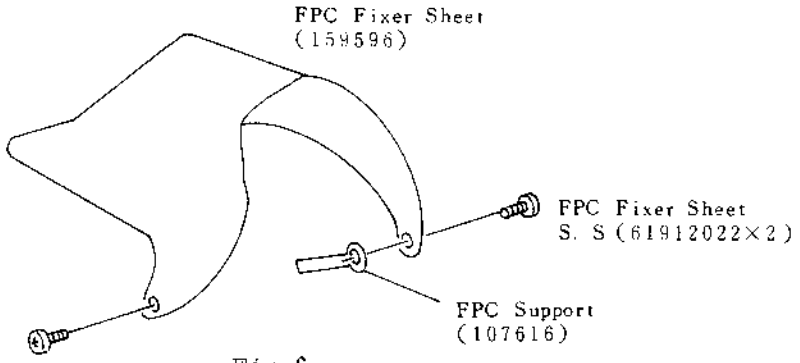


Fig 6

b) Unsolder Brown lead wire (from S-Socket) and Gray (Shielded wire) (from Shutter) on the Synchro Base. (Fig 7.
Unsolder Jumper Wire (from Release Socket) on the ISO Base Plate Ass'v.

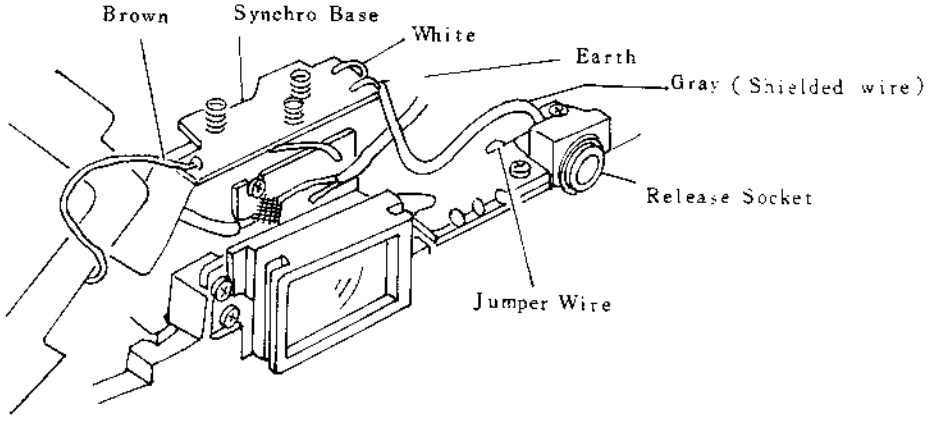


Fig 7

c) Unsolder Black and Yellow (from Shutter) on the front left side. (Fig 8).

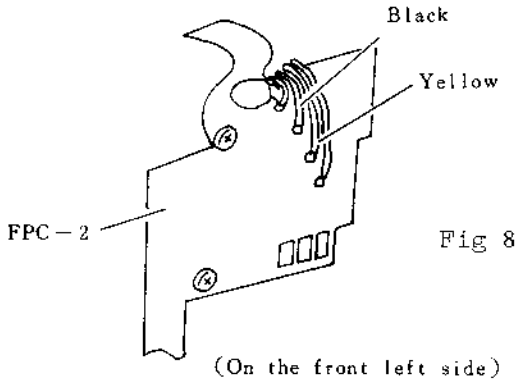


Fig 8

d) Unsolder Red lead wire (from Battery Box), Pink and Blue lead wires (from AC－Mg), three soldering points of AMP Ass'y and FPC－2, soldering point of Battery Box and FPC－2 at the bottom. (Fig 9)

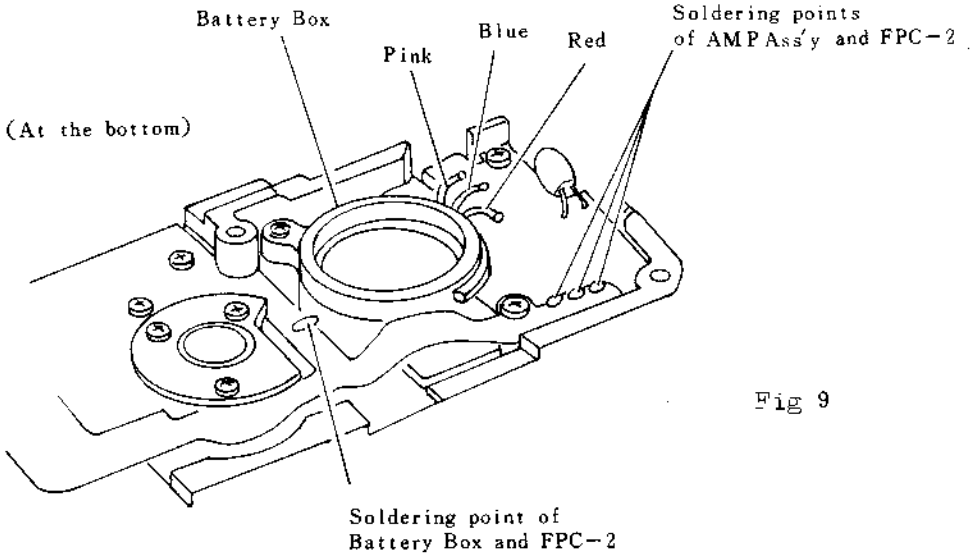


Fig 9

e) Remove the respective parts ① ~ ⑱ Shown in (Fig 10) in numerical order.

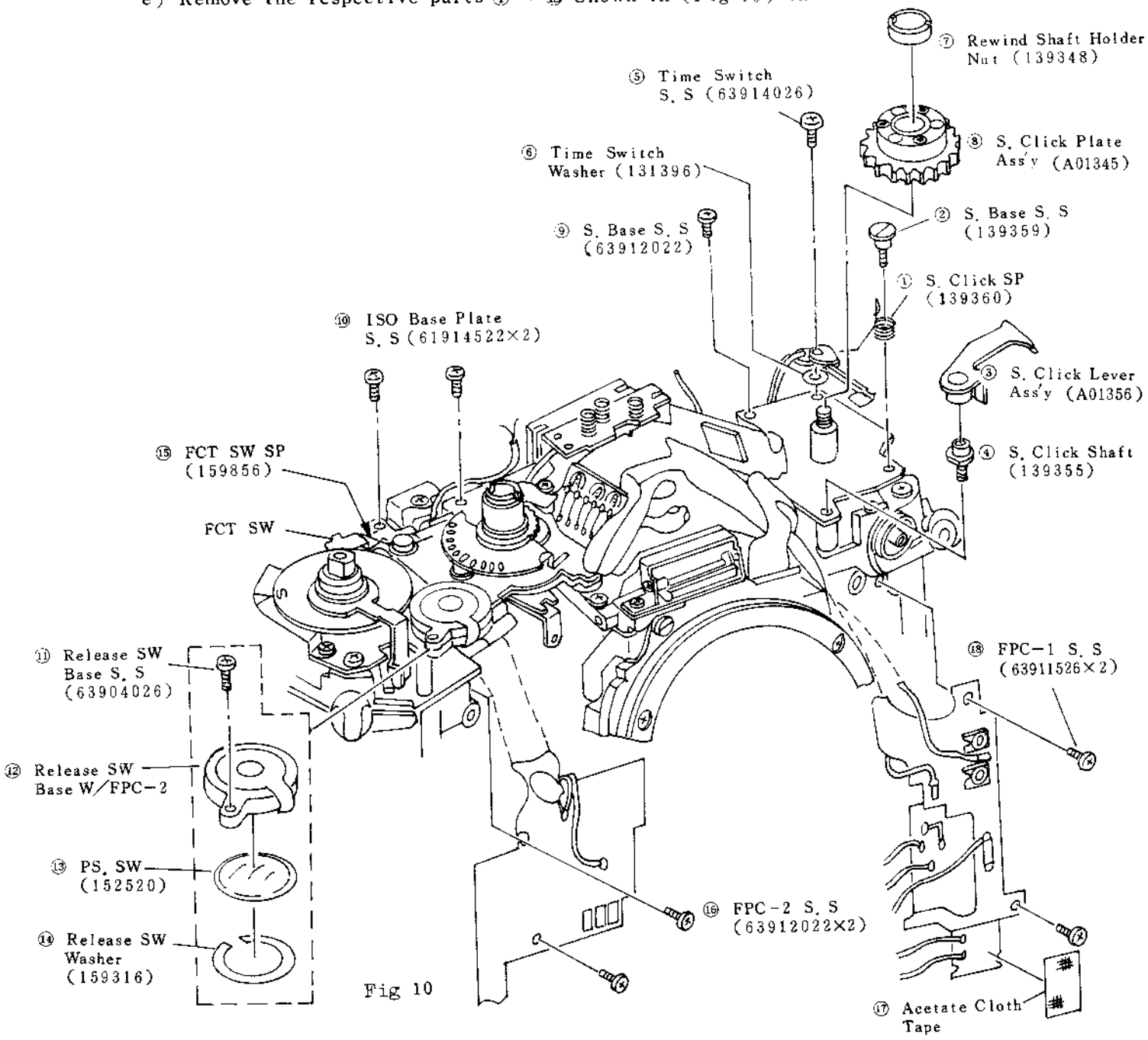

⑦ Rewind Shaft Holder Nut (139348)
⑤ Time Switch S. S (63914026)
⑧ S. Click Plate Ass'y (A01345)
⑥ Time Switch Washer (131396)
② S. Base S. S (139359)
⑨ S. Base S. S (63912022)
① S. Click SP (139360)
⑩ ISO Base Plate S. S (61914522×2)
③ S. Click Lever Ass'y (A01356)
⑮ FCT SW SP (159856)
④ S. Click Shaft (139355)
FCT SW
⑪ Release SW Base S. S (63904026)
⑱ FPC-1 S. S (63911526×2)
⑫ Release SW Base W/FPC-2
⑬ PS. SW (152520)
⑯ FPC-2 S. S (63912022×2)
⑭ Release SW Washer (159316)
⑰ Acetate Cloth Tape

Fig 10

Note:

a) Do avoid damage to the contact of S. Click Plate Ass'y (A01345) during the repair.

b) Do avoid damage to the FCT SW during the repair. (Fig 10)

c) Make sure the Acetate Cloth Tape is in position when reassembling.

d) Remove the respective parts ① ~ ⑤ shown in (Fig 11) in numerical order.

e) Remove the D-LED W/FPC-1 from camera body at the bottom.

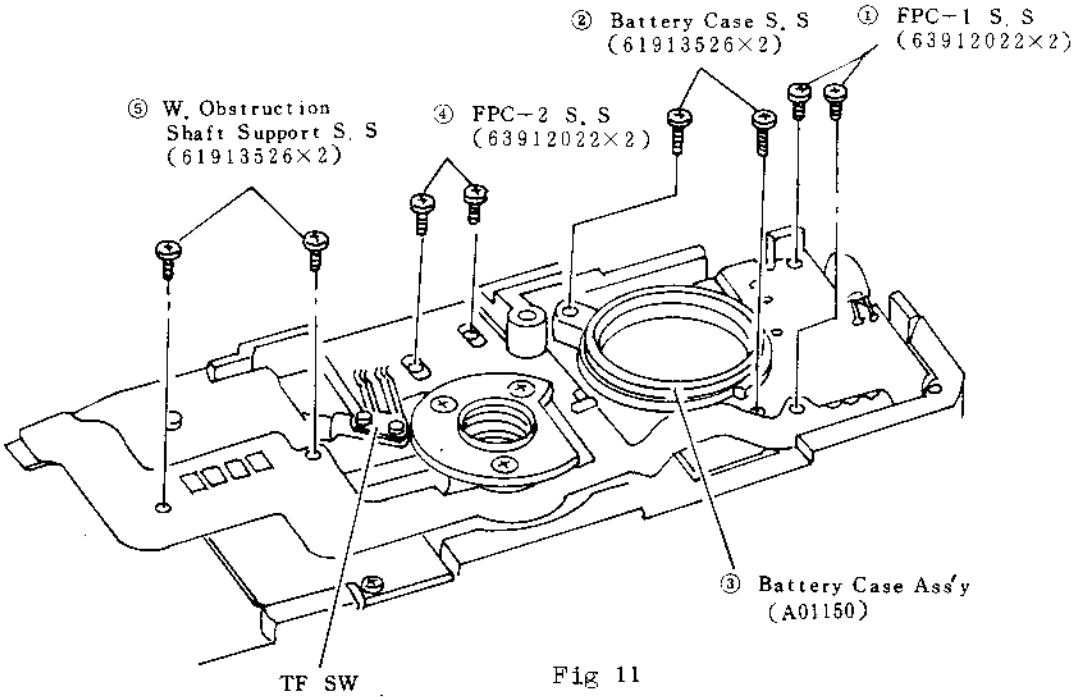


Fig 11

Note:

Do avoid damage to the TF SW during the repair.

f) Remove two Eye-piece Frame Set Screws (61913526×2), Eye-piece Frame (159168), SPD Guard (SS)(159848) and SPD Guard (S)(159846). (Fig 12)

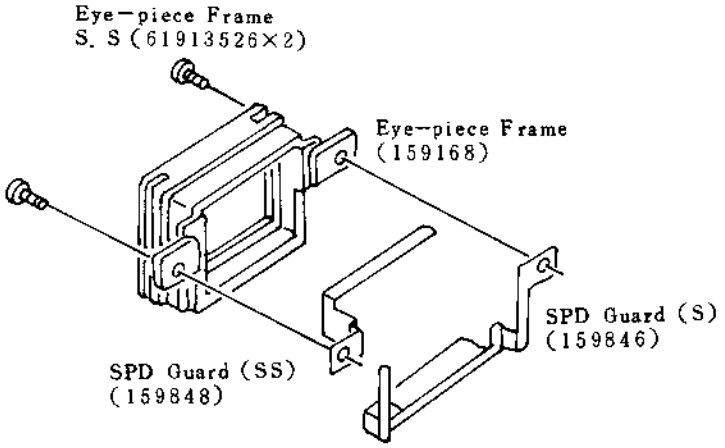


Fig 12

g) Remove four Mirror Box Set Screws (66001060×2)(61927026×2) and carefully pull out the Mirror Box Ass'y from the camera body (Mirror Box Ass'y, will be removed together with AMP Ass'y and ISO Base Plate W/FPC -2). (Fig 13)

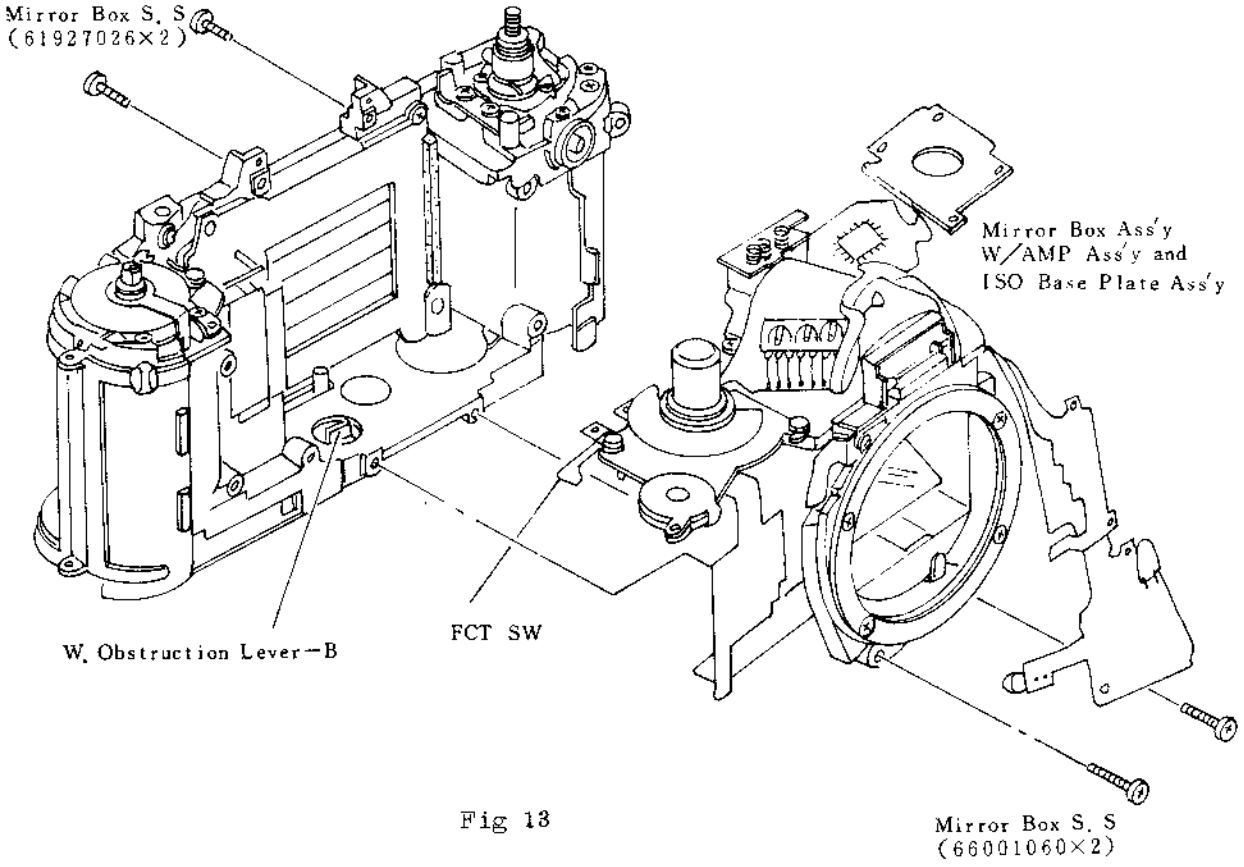


Fig 13

〔Directions for attaching the Mirror Box Ass'y into the Camera body〕

a) Charg the Shutter and Mirror Box Ass'y.
b) Mount the Mirror Box parallel with front side of the camera body and Pin of ACL-1 (Fig 18) at the front of W.Obstruction Lever-B (Fig 13).
c) Check the FCT SW and lead wires for their held conditions.
d) Tighten four Mirror Box Set Screws (66001060×2)(61927026×2).

Note :

a) When mount the Mirror Box, caution not to pinch lead wires.

3. DISASSEMBLING AND ADJUSTMENT OF THE MIRROR BOX.

(1) Disassembling of the AC Base Plate Ass'y from the Mirror Box.

(At the bottom of Mirror Box)

a) Remove the respective parts ①~④ Shown in (Fig 14) in numerical order.

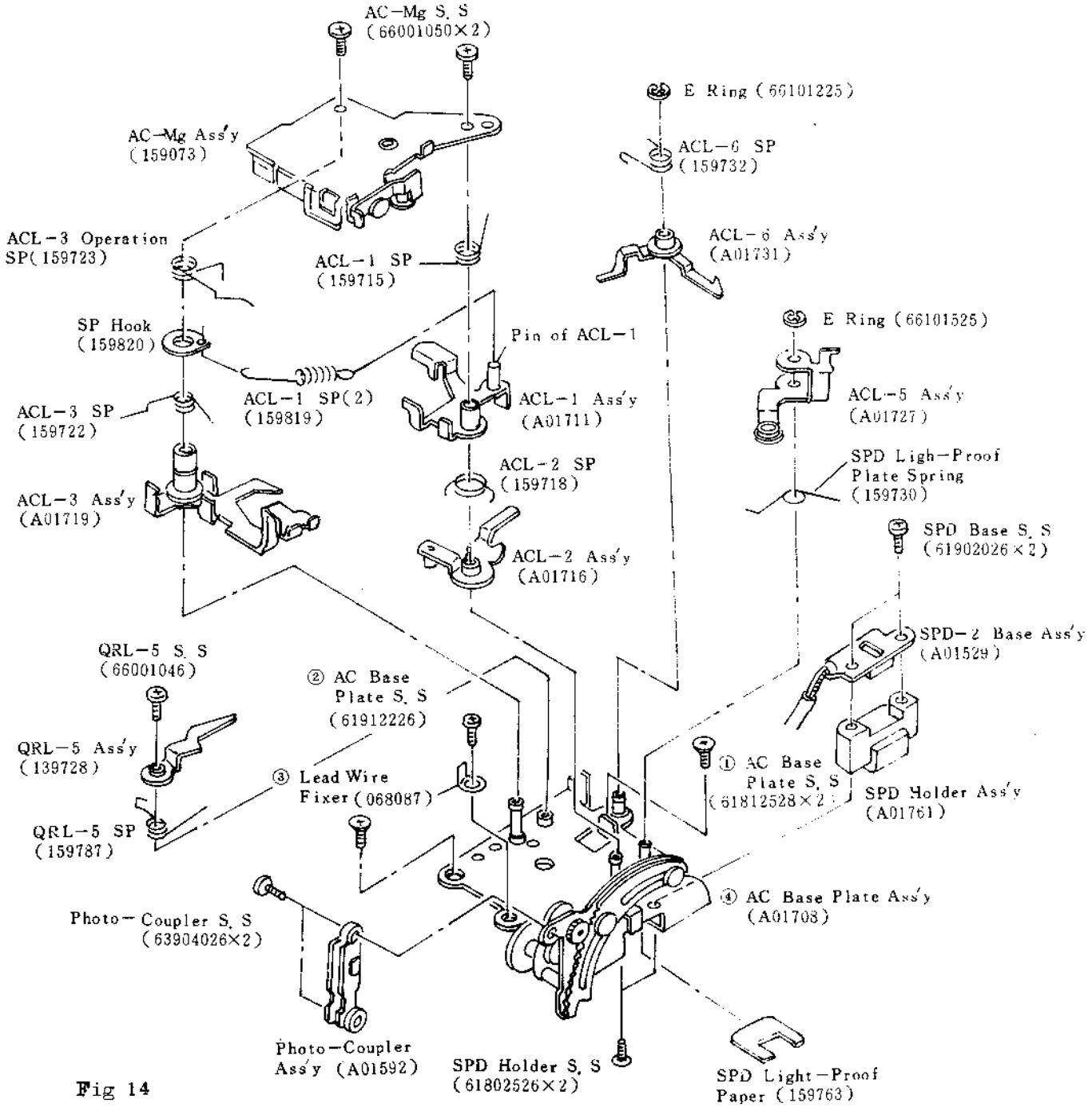


Fig 14

(2) Reassembling of AC Disc Ass'y

a) Position of ACL-4 as shown (Fig 15).

b) Insert the AC Disc Ass'y (A01736) to the Shaft of Gear 3 abut 3/4 deep of its length.

c) Push AC Disc Spring against AC Base Plate.

d) Turning the AC Disc Ass'y in the direction of arrow as shown in (Fig 15) on the harifway (180°) and then completely, insert the AC Disc Ass'y.

e) Fix the E Ring (66100825).

f) Check the AC Disc Ass'y for its operation.
AC Disc Ass'y should normally be returned smooth under spring forces.

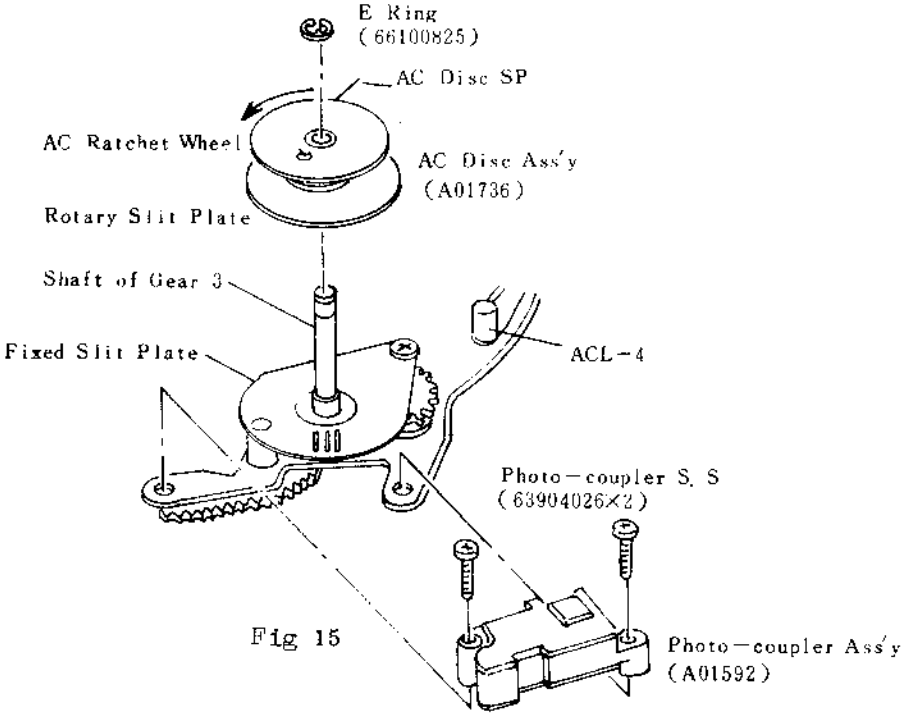


Fig 15

Note:

a) Apply Cemedine 551A to AC Disc Spring and AC Base Plate.((Fig 17).

b) Do not apply any oil to the AC Disc Ass'y and etc.

(3) Note for SPD-2 Base Ass'y

a) Never touch SPD-2 Base Ass'y with hand (finger) directly during the repair. If you touch, clean with Ether-Alcohol.

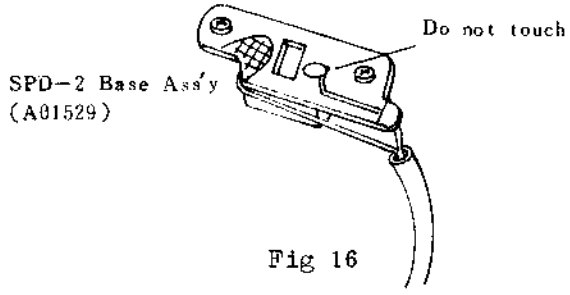


Fig 16

(4) Note for reassembling AC-Mg Ass'y.

a) Never assemble AC-Mg Ass'y (159073) under setting condition of ACL-1 Ass'y and QRL-5 Ass'y.

b) Take care not to deform the ACL-1 Spring (159715), because it is too strong. Never use deformed ACL-1 Spring.
If ACL-1 Spring is deformed, the hook of R-Mg is not engaged with the MCL-2. (Fig18)

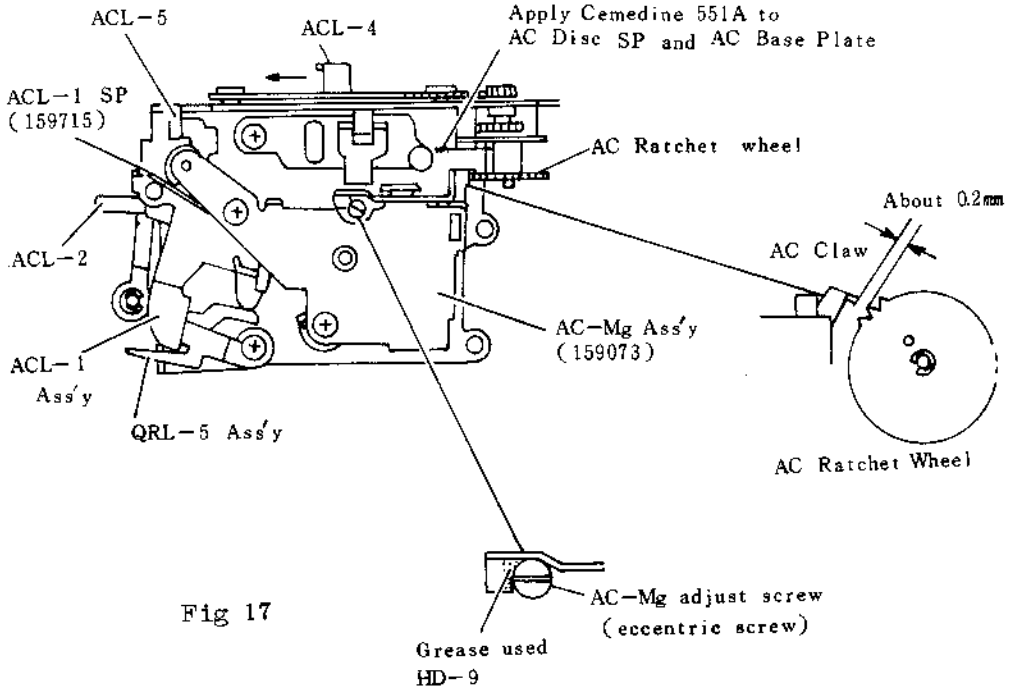


Fig 17

(5) Clearance of AC Claw and AC Ratchet Wheel adjustment.

- o Does not touch with AC Claw and AC Ratchet Wheel.
- o Clearance is between about 0.2㎜.
- o Adjust clearance by turning the AC-Mg adjust screw. (Fig 17).

(6) R-Mg adjustment

a)Remove the ACL-1 Spring (2)(159819).

b)Set the ACL-1 Ass'y and QRL-5 Ass'y.

c)Turning the ACL-4 in the direction of arrow as shown in (Fig 17) by finger and hold it.

d)R-Mg Hook is engaged with MCL-2 when release the R-Mg (R-Mg Hook should release the MCL-2) and release the ACL-1 Ass'y and QRL-5 Ass'y by pushing the MCL-6 (Fig 20).

These tests should be repeated several times.

- o If R-Mg Hook is not engaged with MCL-2, film winds, the Shutter trips at same time (by employment of W-7 Winder).

- o If clearance of R-Mg Hook and MCL-2 is wide, the AC Ratchet Wheel is moving when slowly set the ACL-1 Ass'y and QRL-5 Ass'y. If AC Ratchet Wheel is moving, program exposure should be under.

- o Make loose two R-Mg Set Screws (66001050×2) and adjust the engagement of R-Mg Hook and MCL-2.
  After adjustment, apply Cemedine 551A to R-Mg Set Screws.

Note:

a) Never use grease or oil except specified grease near R-Mg.

b) R-Mg has permanent magnet, so it has to be out of soil, iron powder or dust. If repulsion or attraction is improper, clean the Magnet.

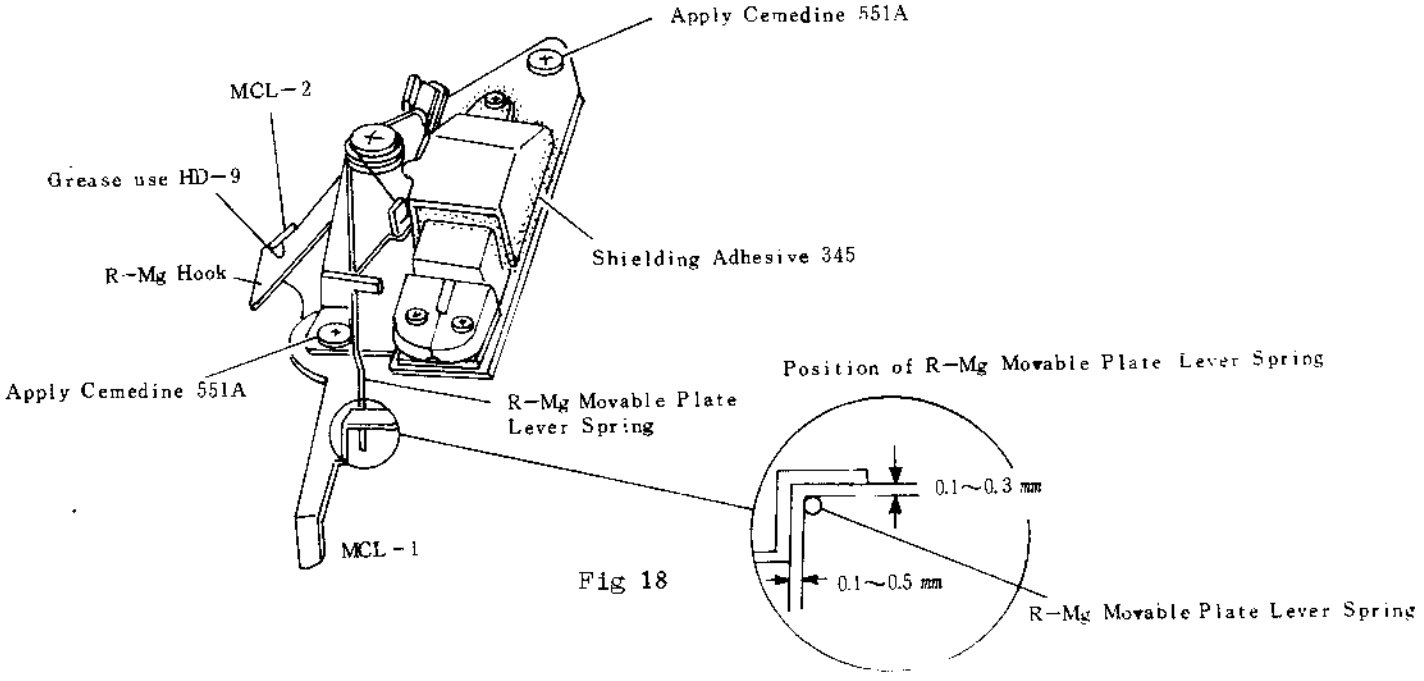


Fig 18

(7) Adjustment of Shutter releasing position.

o Make sure Shutter is released within 2.0 ± 1.0 mm between Mirror surface and Mirror Chshion (137806) as shown in (Fig 19).

o Adjust Shutter release position by bending MCL－8 as shown in (Fig 20).

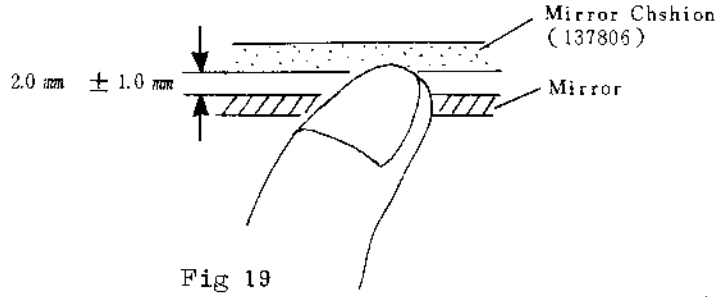


Fig 19

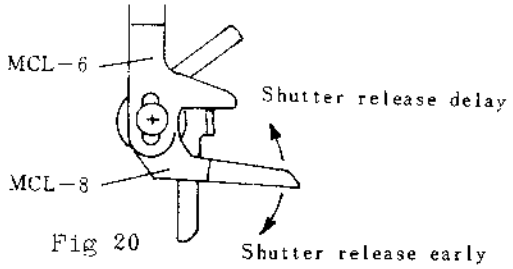


Fig 20

※ The mirror must move smooth without abnormal noise.

(8) Assembling and Adjustment of the Aperture Code Base Ass'y.

a) Push Pin of F. Stop Connecting Ring in the direction of the arrow until stops. (f／1.2 aperture position). (Fig 21)

b) Align the head of Aperture Code Contact with the triangular index (▲) on the Aperture Code Base, and while maintaining this position carefully engage the Aperture Connecting Gear to the Gear of F. Stop Connecting Ring on the Mirror Box Ass'y, and tighten two Aperture Code Base Set Screws (63912522×2).

c) Make sure align the head of Aperture Code Contact with the triangular index (▲) on the Aperture Code Base when the F. Stop Connecting Ring should normally be returned smooth under spring forces (Fig 22)

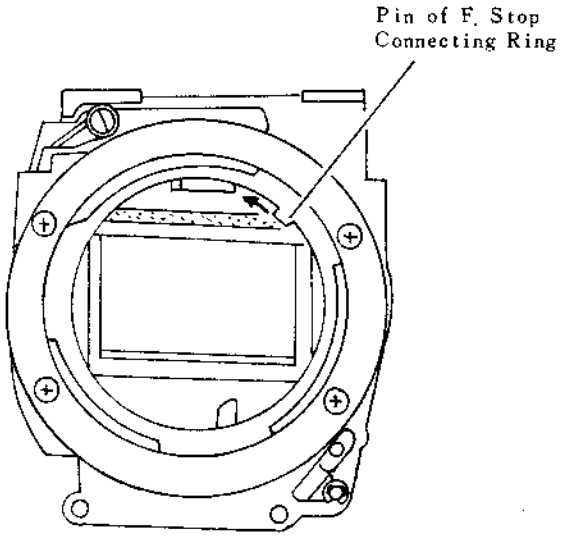


Fig 21

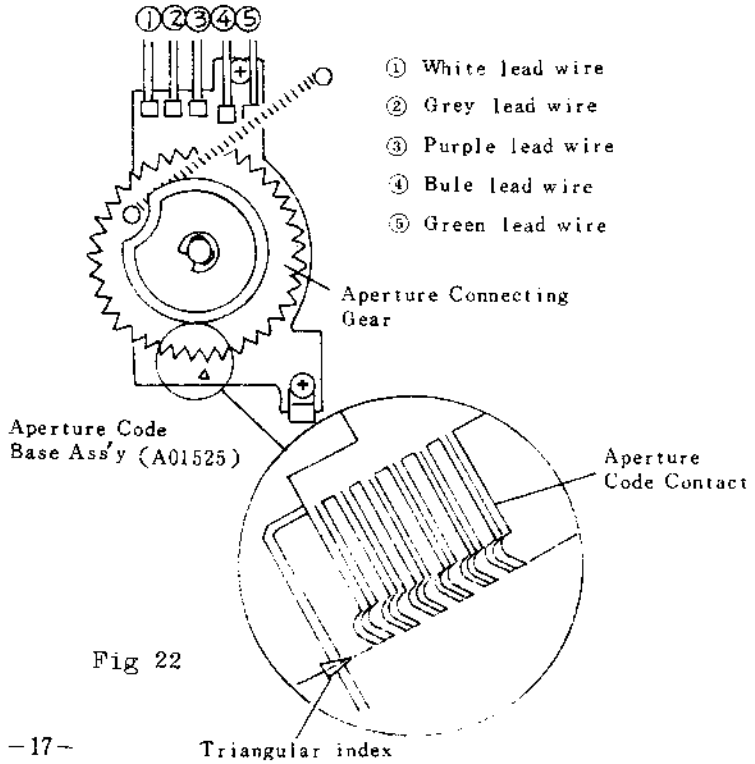


Fig 22

4. DISASSEMBLING AND ADJUSTMENT OF THE SHUTTER.

(1) Disassembling of the Shutter from the camera body.

a) Remove three Shutter Set Screws (61924022) and Shutter (159201). (Fig 24)

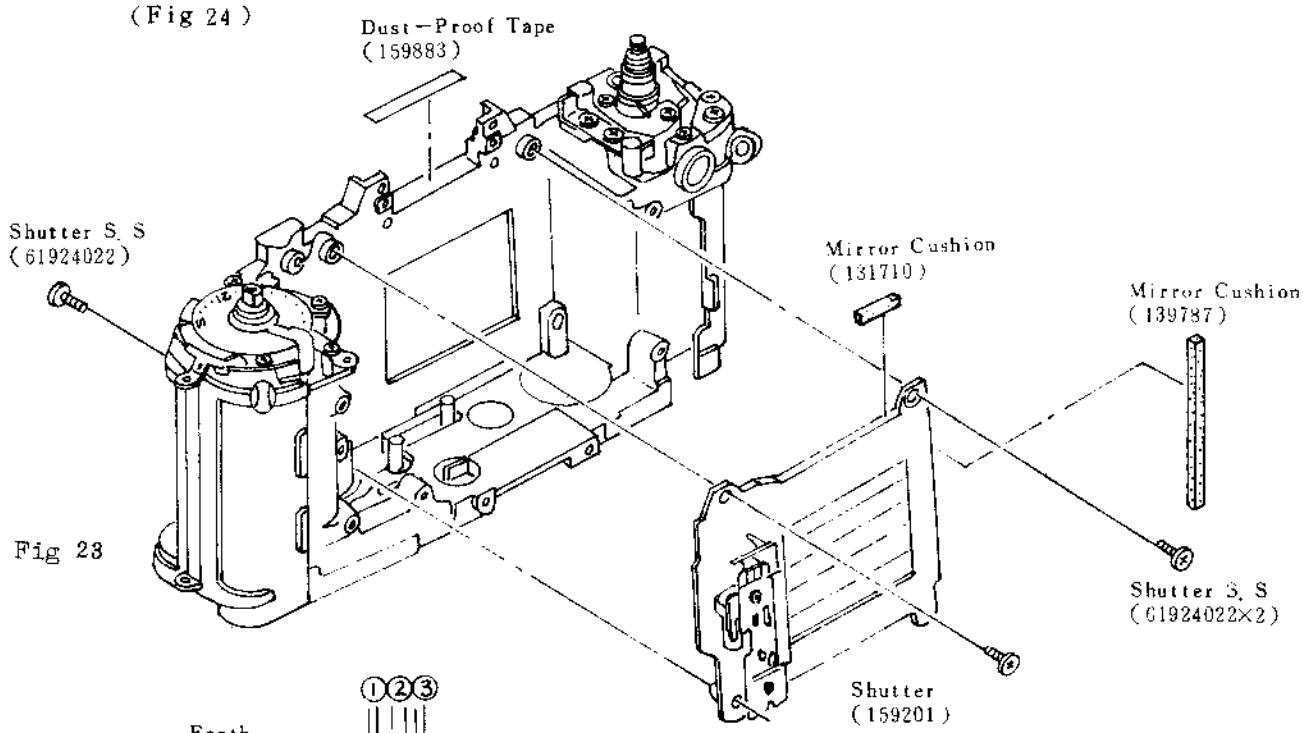


Fig 23

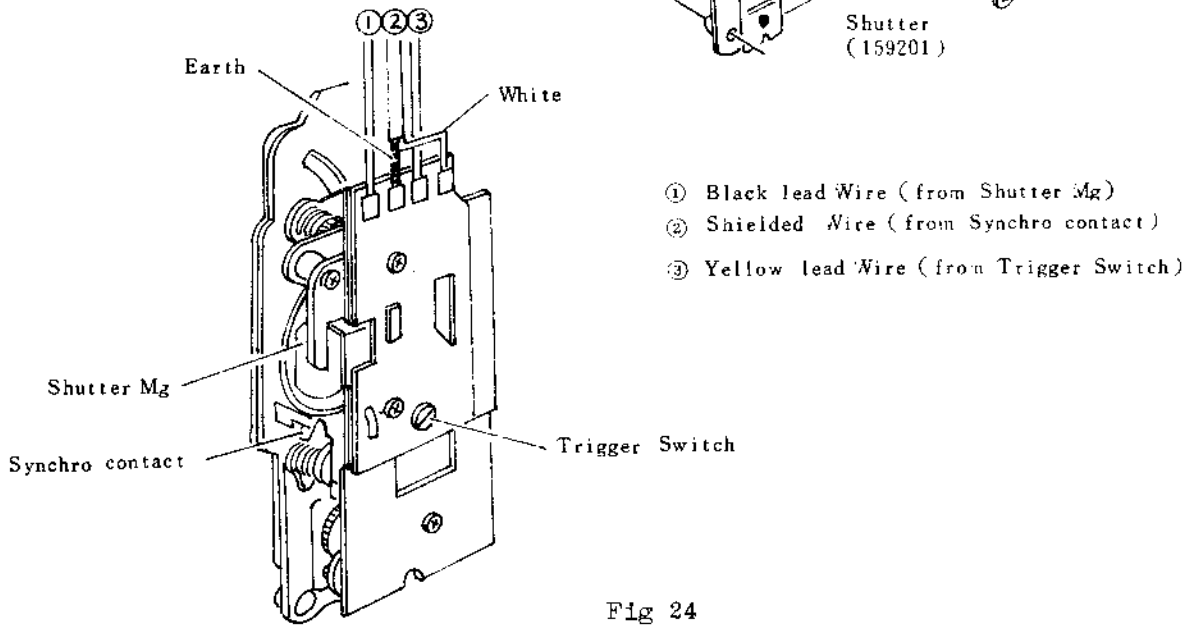


Fig 24

(2) Directions for attaching the Shutter into the camera body.

a) Attach the Shutter into the camera body.

b) Temporarily, tighten two Shutter Set Screws (61924022×2) on the front side of Shutter.

c) Tighten the Shutter Set Screw (61924022) on back side of camera body and then tighten completely two Shutter Set Screws (61924022×2) on the front side of Shutter.

Note: Make sure the Mirror Cushion (139787), Mirror Cushion (151710) and Dust-Proof Tape (159883) are in position when reassembling.

(3) Shutter Curtain Travel Speed.

a) The Shutter Curtain Travel Speed should be within 2.95 ms.

(4) Menual Shutter Speed.

a) The shutter speed (1/4000 & 1/2000 sec.) can be adjusted by adjusting the Trigger Switch. (Fig 24)

Shutter Speed Tolerance Limits.

	Max.	Standard	Min.
1/1	1035	1000	966
1/2	517.6	500	483
1/4	258.8	250	241.5
1/8	134.0	125	116.6
1/15	66.99	62.5	58.31
1/30	33.55	31.3	29.20
1/60	16.75	15.63	14.58
1/125	8.37	7.81	7.29
1/250(×)	5.0	4.79	4.6
1/500	2.40	1.95	1.58
1/1000	1.21	0.98	0.80
1/2000	0.60	0.49	0.40
1/4000	0.345	0.244	0.172

(m sec.)

(5) Synchro contact.

a) Time Lag

The synchro switch must be turned ON within a time range from immediately after the 1st curtain is fully opened till 1.3ms after the 2nd curtain starts closing.

A-Slit : 0.1～0.8 m sec

B-Slit : 1.3 m sec or more.

b) Synchro contact efficiency

60% or more (TIME INT. 1ms)

c) Synchro insulation resistance

30MΩ or more (DC 500V)

5. DISASSEMBLING AND REASSEMBLING OF THE WINDING MECHANISM

(1) Disassembling of the Winding Mechanism.

(At the bottom of the camera body)

a) Remove the respective parts ① ~ ⑱ shown in (Fig 25) in numerical order.

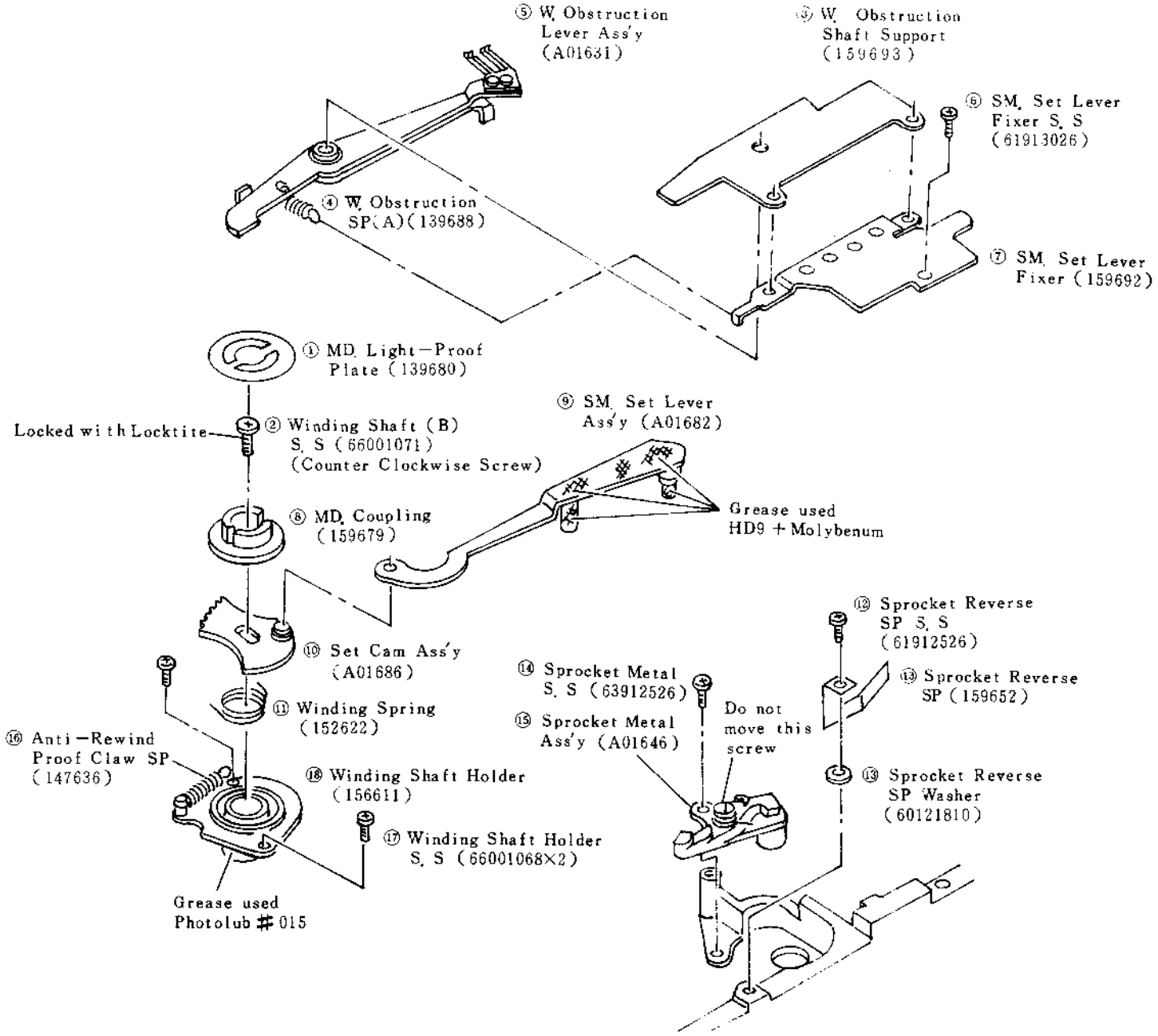

⑤ W. Obstruction Lever Ass'y (A01631)
③ W. Obstruction Shaft Support (159693)
⑥ SM. Set Lever Fixer S. S (61913026)
④ W. Obstruction SP(A)(139688)
⑦ SM. Set Lever Fixer (159692)
① MD. Light-Proof Plate (139680)
⑨ SM. Set Lever Ass'y (A01682)
Locked with Locktite
② Winding Shaft (B) S. S (66001071) (Counter Clockwise Screw)
⑧ MD. Coupling (159679)
Grease used HD9 + Molybenum
⑫ Sprocket Reverse SP S. S (61912526)
⑩ Set Cam Ass'y (A01686)
⑭ Sprocket Metal S. S (63912526)
⑬ Sprocket Reverse SP (159652)
⑪ Winding Spring (152622)
⑮ Sprocket Metal Ass'y (A01646)
Do not move this screw
⑯ Anti-Rewind Proof Claw SP (147636)
⑱ Winding Shaft Holder (156611)
⑬ Sprocket Reverse SP Washer (60121810)
⑰ Winding Shaft Holder S. S (66001068×2)
Grease used Photolub #015

Fig 25

Note:

a) Winding Shaft (B) Set Screw (66001071) is counter clockwise screw.

b) The MD. Coupling (159679) and Set Cam Ass'y (A01686) are pressed in against the Winding Shaft (B).
So forcibly lever up MD. Coupling and Set Cam Ass'y with screwdriver №6.

c) Take care not to deform the contact of W. Obstruction Lever Ass'y (A01631) during the repair.

(At the top of the camera body)

b) Remove the respective parts ① ~ ⑫ shown in (Fig 26) in numerical order.

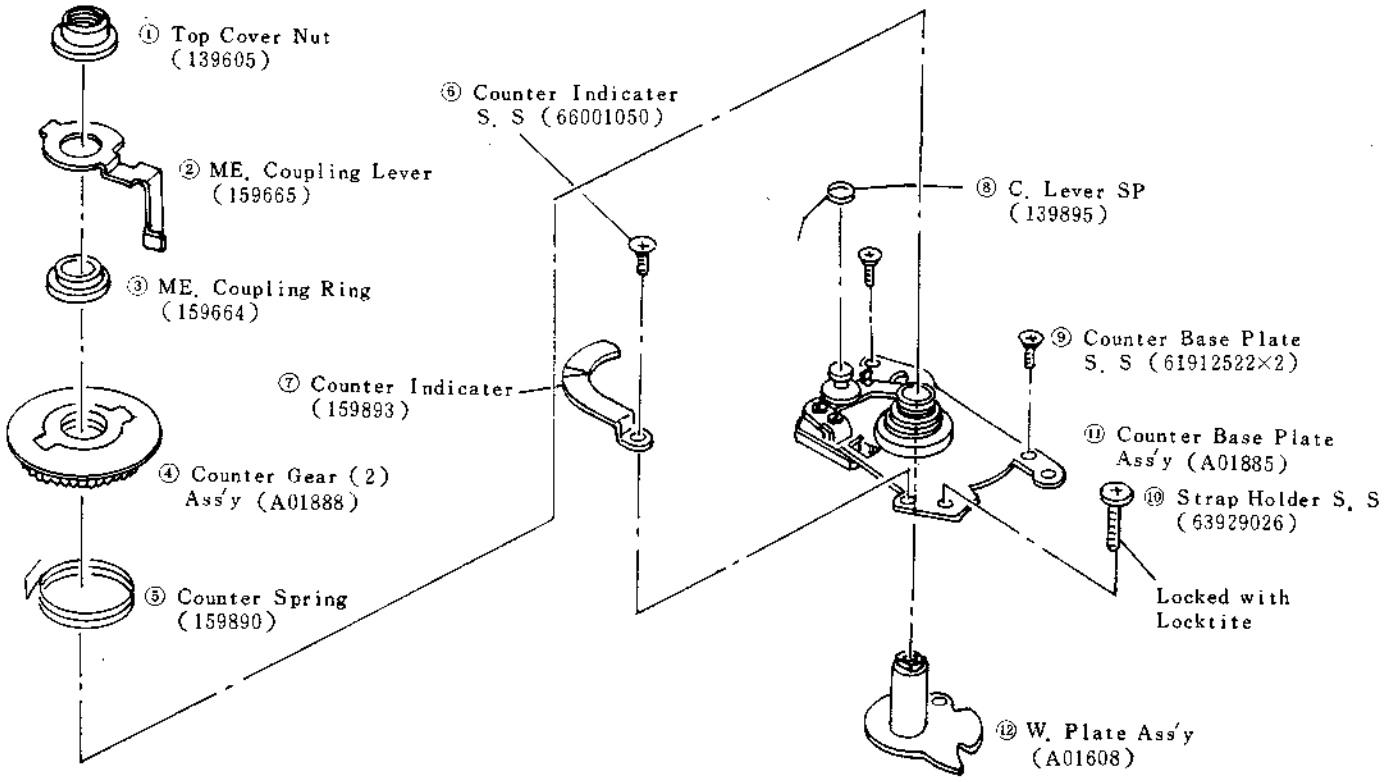

① Top Cover Nut (139605)
② ME. Coupling Lever (159665)
③ ME. Coupling Ring (159664)
④ Counter Gear (2) Ass'y (A01888)
⑤ Counter Spring (159890)
⑥ Counter Indicater S. S (66001050)
⑦ Counter Indicater (159893)
⑧ C. Lever SP (139895)
⑨ Counter Base Plate S. S (61912522×2)
⑩ Strap Holder S. S (63929026)
⑪ Counter Base Plate Ass'y (A01885)
Locked with Locktite
⑫ W. Plate Ass'y (A01608)

Fig 26

c) Remove the respective parts ① ~ ⑰ shown in (Fig 27) in numerical order.

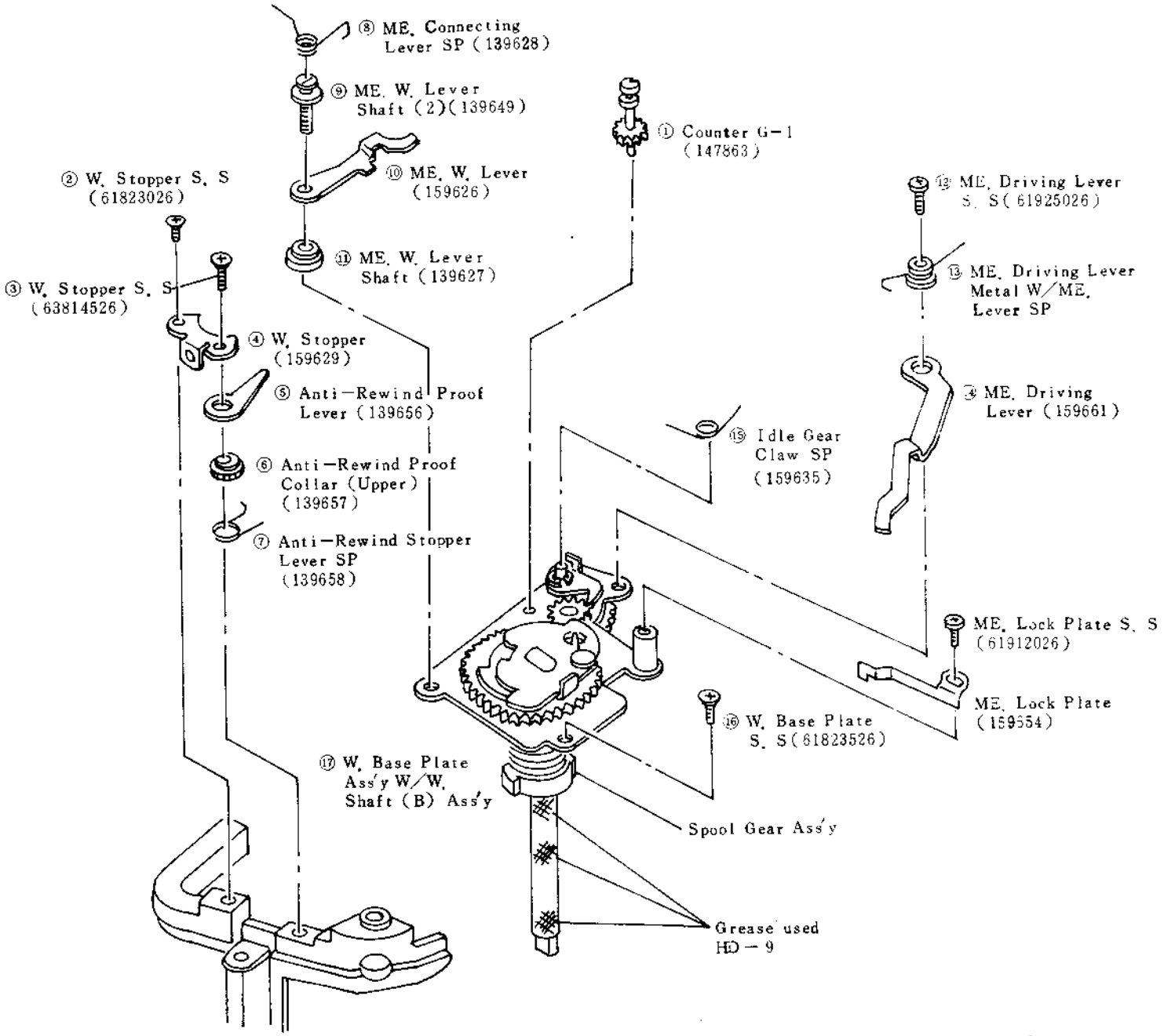

⑧ ME. Connecting Lever SP (139628)
⑨ ME. W. Lever Shaft (2)(139649)
⑩ ME. W. Lever (159626)
⑪ ME. W. Lever Shaft (139627)
① Counter G-1 (147863)
② W. Stopper S. S (61823026)
③ W. Stopper S. S (63814526)
④ W. Stopper (159629)
⑤ Anti-Rewind Proof Lever (139656)
⑥ Anti-Rewind Proof Collar (Upper) (139657)
⑦ Anti-Rewind Stopper Lever SP (139658)
⑫ ME. Driving Lever S. S (61925026)
⑬ ME. Driving Lever Metal W/ME. Lever SP
⑭ ME. Driving Lever (159661)
⑮ Idle Gear Claw SP (159635)
ME. Lock Plate S. S (61912026)
ME. Lock Plate (159654)
⑯ W. Base Plate S. S (61823526)
⑰ W. Base Plate Ass'y W/W. Shaft (B) Ass'y
Spool Gear Ass'y
Grease used HD-9

Fig 27

d) Remove the respective parts ① ~ ③ shown in (Fig 28) in numerical order.

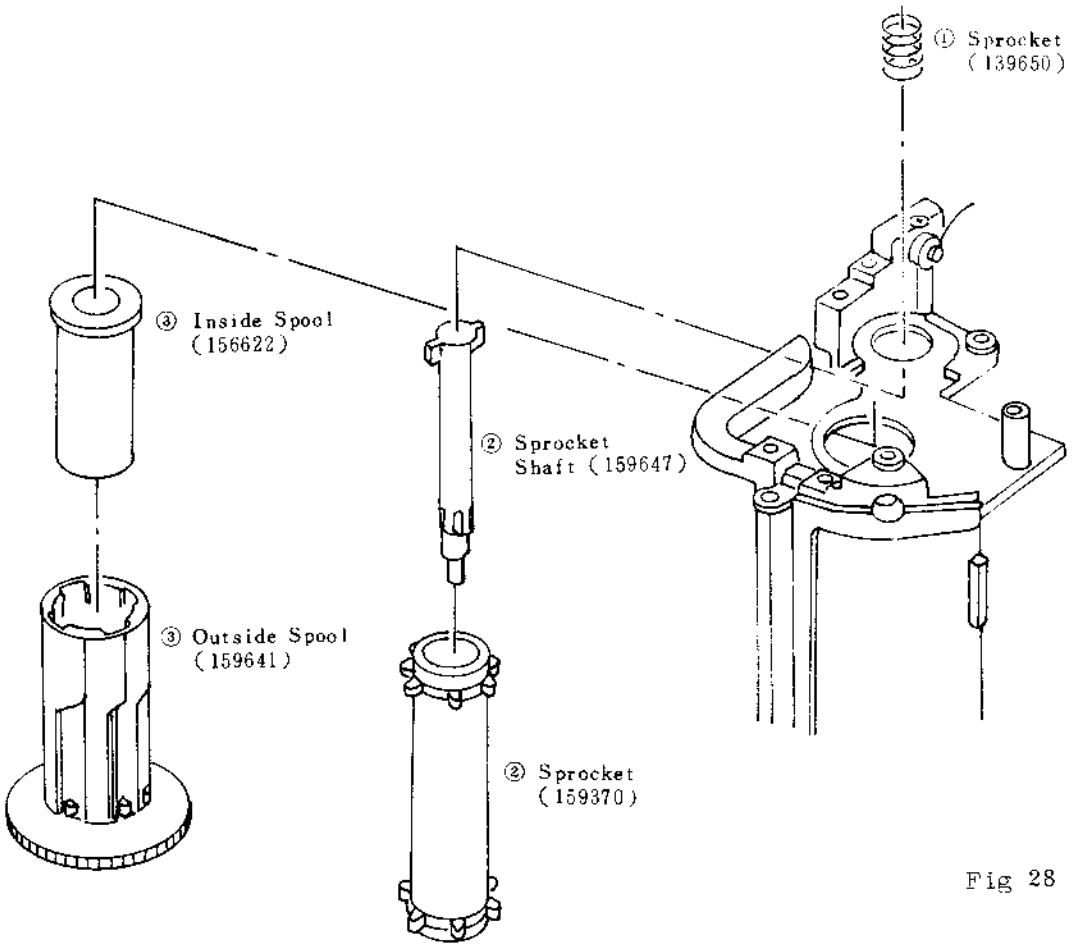


Fig 28

(2) Reassembling of the Winding Mechanism.

(At the top of the camera body)

a) Set the Outside Spool (159641) with Inside Spool (156622) into the camera body and Spool Gear Ass'y (066601).

b) Insert the Sprocket Shaft (159647) to the Sprocket (159370) in the position as shown (Fig 29) and set in into the camera body while mark of Sprocket Shaft is face of film rail plane.

Insert the Sprocket Spring (139650) on the Sprocket Shaft.

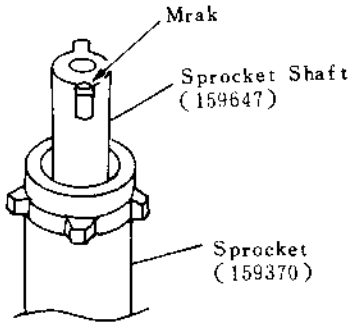


Fig 29

c) Make position with Sprocket Gear and drawn line mark of Idle Gear (A) as shown in (Fig 30) and while maintaining Sprocket position carefully set winding Base Plate Ass'y (A01614) into the camera body. Tighten the Winding Base Plate Set Screw (61823526).

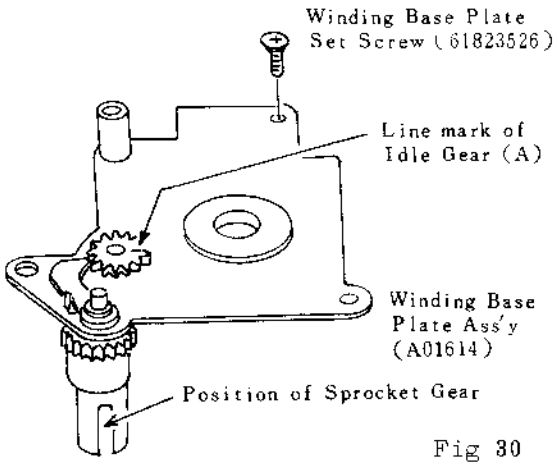


Fig 30

d) Confront drawn line mark of Idle Gear (A) with drawn line mark (or punched mark) of W. Gear (159625), and set W. Gear as shown in (Fig 31)

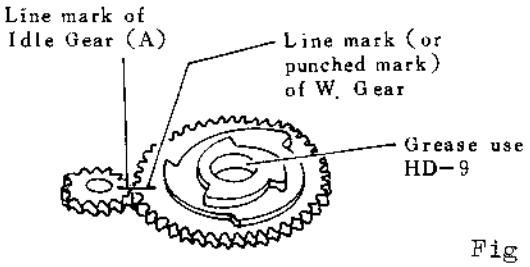


Fig 31

e) Insert the W. Shaft (B) Ass'y (A01618) in the position as shown in (Fig 32).

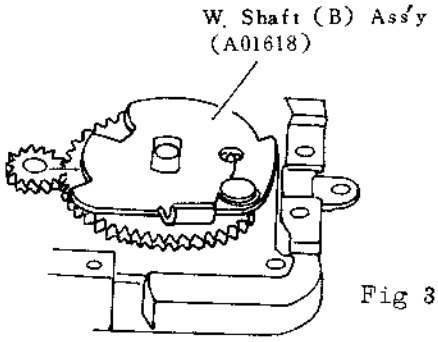


Fig 32

Note:

If you set on shifted position of Sprocket Shaft mark, Sprocket Gear position, Idle Gear (A) drawn line mark and W. Gear drawn line mark, causes of the film perforation position shift would come.

(At the bottom of the camera body)

f) Set the Winding Shaft Holder (156611) and tighten two Windind Shaft Holder Set Screws (66001068×2).

g) Set the Winding Spring (147632) in slot of Winding Shaft Holder.

h) Set the Set Cam Plate Ass'y (A01686) as shown in (Fig 33) and push it in.

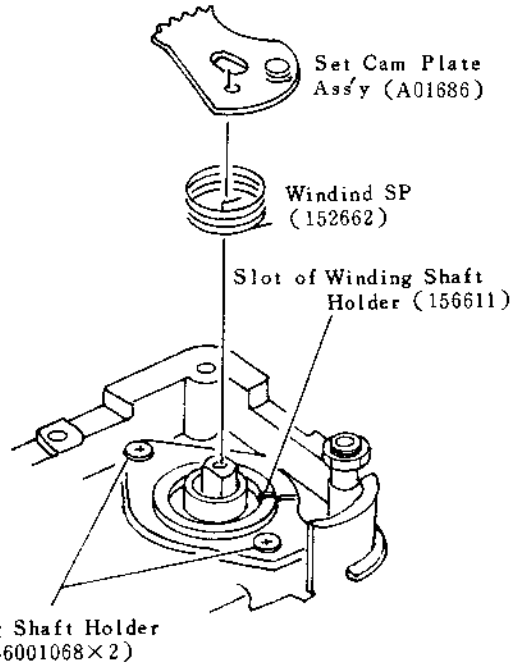


Fig 33

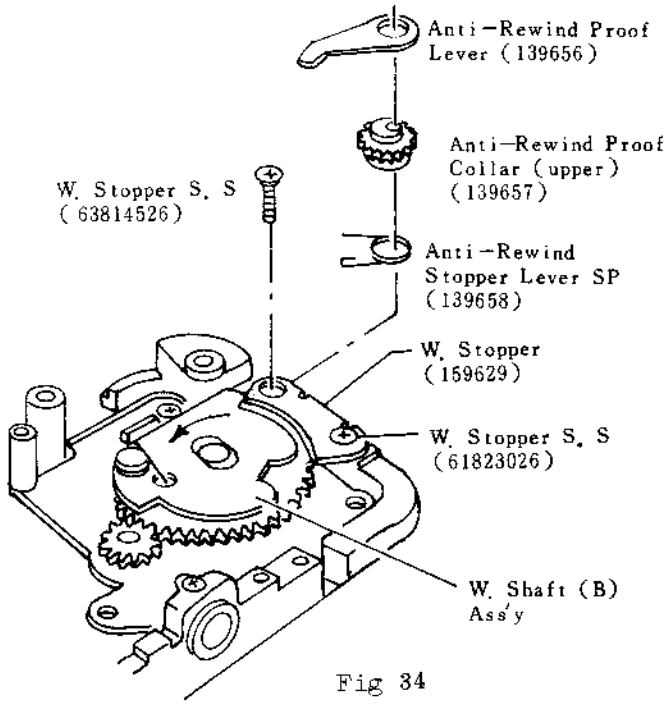
〔Note for reassembling〕

The Set Cam Plate Ass'y is pressed in against the Winding Shaft (B). So it too hard to push the Set Cam Plate Ass'y.
Temporally, set the MD. Coupling (159679) and tighten the Winding Shaft (B) Set Screw (66001071) (counter clockwise screw).
Install the Set Cam Plate Ass'y all the way.
Remove the Winding Shaft (B) Set Screw and MD. Coupling.

(At the top the camera body)

i) Turn the W. Shaft (B) Ass'y in the direction of arrow as shown in (Fig 34) and hold it, set the W. Stopper (159629) and tighten the W. Stopper S. S (61823026).

j) Set the Anti-Rewind Proof Lever (139656), Anti-Rewind Proof Collar (upper)(139657), Anti-Rewind Stopper Lever Spring (139658) and tighten the W. Stopper S. S (63814526).


Anti-Rewind Proof Lever (139656)
Anti-Rewind Proof Collar (upper) (139657)
W. Stopper S. S (63814526)
Anti-Rewind Stopper Lever SP (139658)
W. Stopper (159629)
W. Stopper S. S (61823026)
W. Shaft (B) Ass'y
Fig 34

(At the bottom of the camera body)

k) Set the Sprocket Metal Ass'y (A01646) and tighten the Sprocket Metal Set Screw (63912526).

l) Set the Sprocket Reverse Spring Washer (60121810), Sprocket Reverse Spring (159652) and tighten the Sprocket Reverse Spring Set Screw (61912526).

m) Set the SM. Set Lever Ass'y (A01682), MD. Coupling (159679) and tighten the Winding Shaft (B) Set Screw (66001071)(counter clockwise screw).

n) Set the SM. Set Lever Fixer (159692) and tighten the SM. Set Lever Fixer Set Screw (61913026).
See (Fig 25).

(At the top the camera body)

o) Hook the Idle Gear Claw Spring (159635) with Idle Gear Claw (159636) and camera body.

p) Set the ME. Driving Lever (159661) and ME. Driving Lever Metal (139662) with ME. Lever Spring (159666) and tighten the ME. Driving Lever Set Screw (61925026). Hook the ME. Lever Spring with ME. Driving Lever and post of W. Base Plate as shown in (Fig 35).

q) Set the ME. Lock Plate (159654) and tighten the ME. Lock Plate Set Screw (61912026).

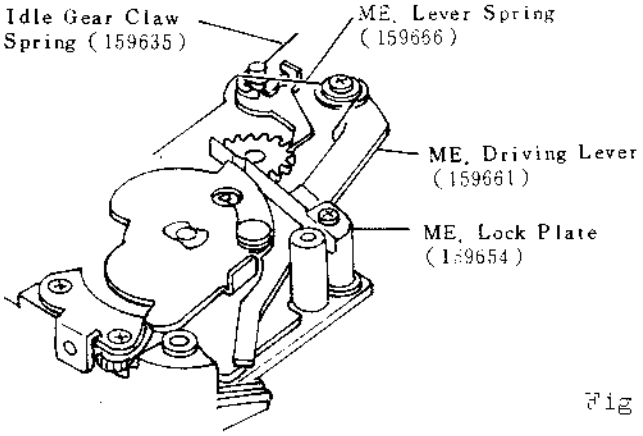


Fig 35

(3) Winding Mechanism Adjustment.

※ The following adjustment and checking is performed after winding mechanism is completely assembled.

(A) Position of Sprocket tooth

Properly position the Sprocket by adjusting position of Sprocket Shaft mark, Sprocket Gear position, Idle Gear (A) drawn line mark and W. Gear drawn line mark.

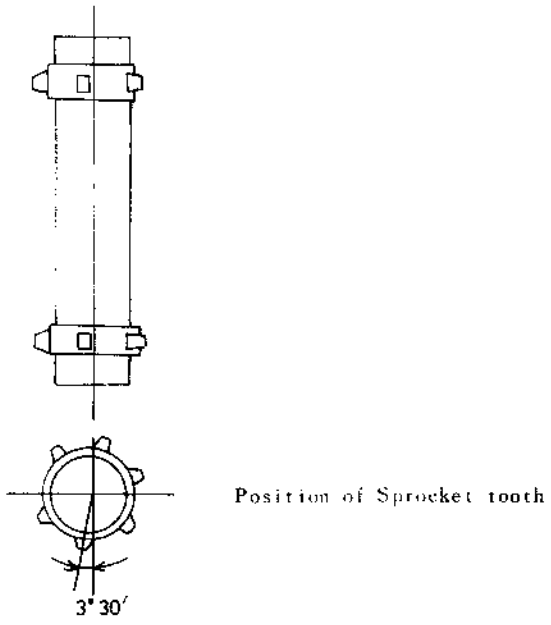


Fig 36

(B) Sprocket Shaft mechanism Adjustment at the bottom of the camera body.

Sprocket Shaft has to be locked and Sprocket has to be quite free by pushing Sprocket Shaft.
Free turn of Sprocket has to be nimble without friction or scratch.
Attach your finger shightly on side of Sprocket, Sprocket Shaft has to be released with turning of Winding Lever.
And Sprocket should never turn freely.
These tests should be repeated several times.
Adjustment is done with Sprocket Reverse Spring (159652).

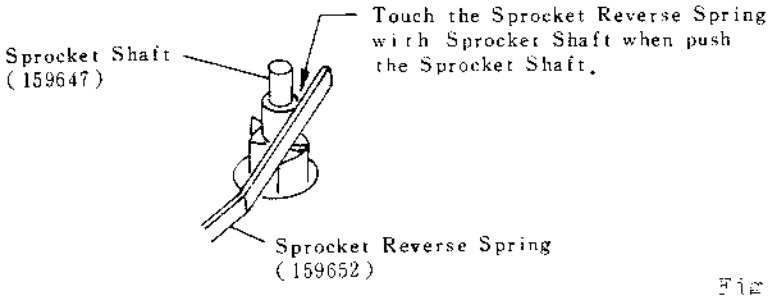

Touch the Sprocket Reverse Spring with Sprocket Shaft when push the Sprocket Shaft.
Sprocket Shaft (159647)
Sprocket Reverse Spring (159652)

Fig 37

(C) OR Stop Lever Adjustment at the bottom of the camera body.

When turn the Winding Lever, OR Stop Lever must be engaged with cut part of Sprocket Shaft and make sure without rattling. After return of Winding Lever, it has to be released from cut part of Sprocket Shaft.
Adjustment is done with OR Stop Lever Shaft.

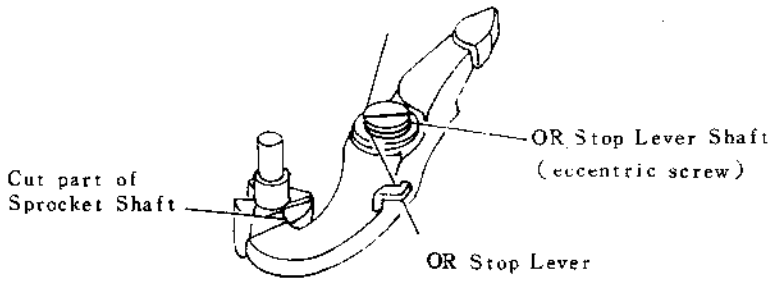


Fig 38

(D) Anti-rewind proof Lever Adjustment at the top of Camera body.

When wind with tension on Sprocket, adjust Anti - rewind Proof Lever (139659) must be engaged with cam of W. Gear (159625) just befor winding stop (0.1 mm).

Adjustment is done with turning of Anti - rewind Proof Collar (upper)(139657).

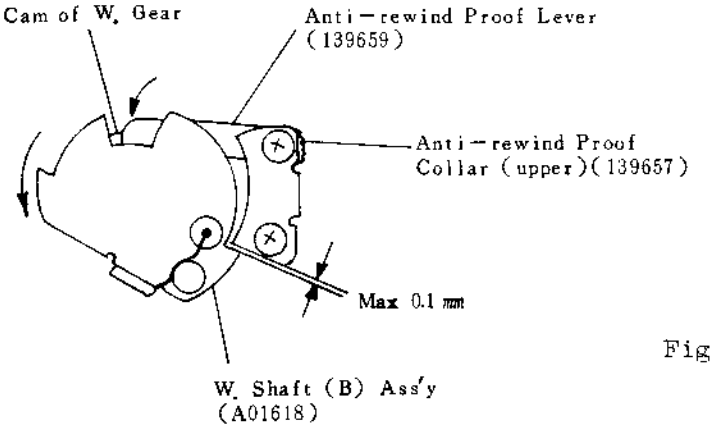


Fig 39

(E) ME. Lock plate Adjustment at the top of the camera body.

When ME W. Lever (159626) is the position of Fig 40 on the way of winding (the Anti - rewind proof Claw is engaged with last gear of Set Cam Ass'y at the bottom of the camera body), clearance of ME. Lock Plate (159654) and ME W. Lever has to be 0.1 ~ 0.2 mm. At just befor winding stop, top of ME W.Lever has to be hooked on ME Lock Plate.

Note : On the way of winding, ME Lock Plate does not push W. Claw. See (Fig 41)

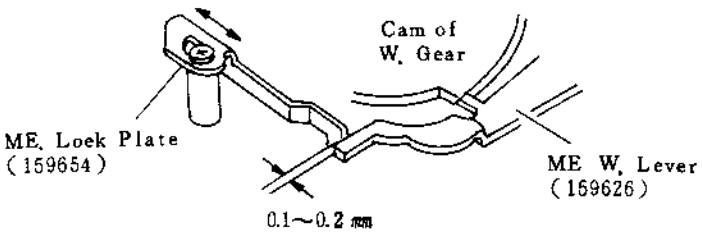


Fig 40

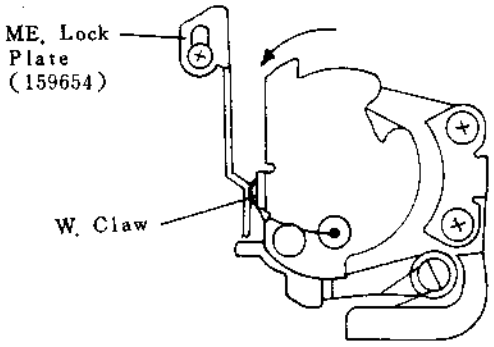


Fig 41

(F) Anti-Rewind proof Claw release Adjustment at the bottom of the Camera body.

When wind with tension on Sprocket, Anti - rewind Proof Lever (139659) Should be engage with cam of W. Gear, then Anti - Rewind Proof Claw must be released from the Gear of Set Cam Plate Ass'y (A01686).

Adjustment is done with turning of Anti - rewind Proof Claw Collar (Eccentric collar).

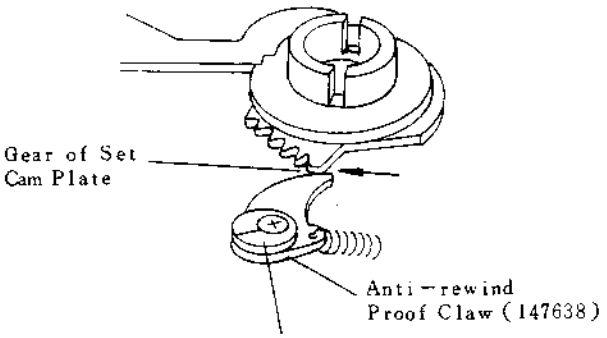


Fig 42

(4) Reassembling of Counter Base Plate Ass'y.

a) Set the W. Plate Ass'y (A01608) as shown in (Fig 43).
b) Make the position which Anti - rewind Proof Lever (139659) is engaged with Cam of W. Gear as shown in (Fig 39).
c) Insert and position the notched section of Counter G - 1 (147868) opposite to the W. Base Ass'y (A01608) as shown in (Fig 43).

Note : If the position of the Counter G - 1 is not correct,it skips two frames or no frame.

d) Set the Counter Base Plate Ass'y (A01885) and tighten two Counter Base Plate Set Screws (61912522×2), Strap Holder Ass'y (061633) and Strap Holder Set Screw (63929026).
e) Fit the C. Lever Spring (139895) as shown in (Fig 44).

Note : If the shape of the C. Lever Spring is changed, the counter skips two frames or no frame.

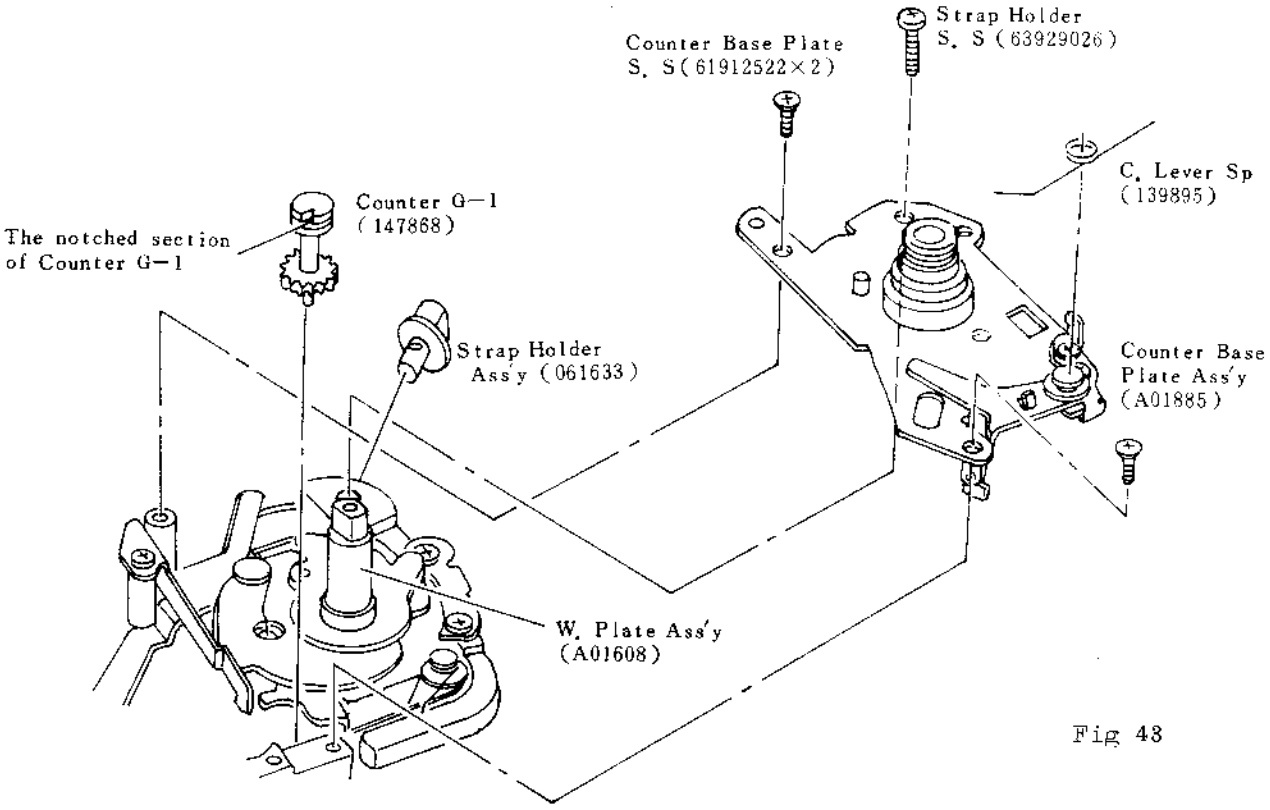


Fig 48

f) Hook the Counter Spring (159890) into the hole of the Counter Gear (2) Ass'y (A01888).

g) Fit the Counter Gear (2) Ass'y with the Counter Spring over the Shaft of the Counter Base Plate Ass'y (A01885) and then hook the Counter Spring into the hole of the Counter Base Plate Ass'y.

h) Turn the Counter Gear (2) Ass'y in the direction of arrow as shown in (Fig 44) and come to a stop it then lift up it about 2.0～3.0㎜ and lift down it.

i) Set the ME. Coupling Ring (159664), ME. Coupling Leve (159665) and tighten the Top Cover Nut (139605). Check the Counter Gear (2) Ass'y for its operation. Counter Gear (2) Ass'y should normally be returned smooth under spring forces.

j) Set the Counter Indicater (159893) and tighten the Counter Indicater Set Screw (66001050).

All the characters must be located with in the range of the indicaes, and character 〝S〞 must be aligned with the index when the Back Cover is opened.

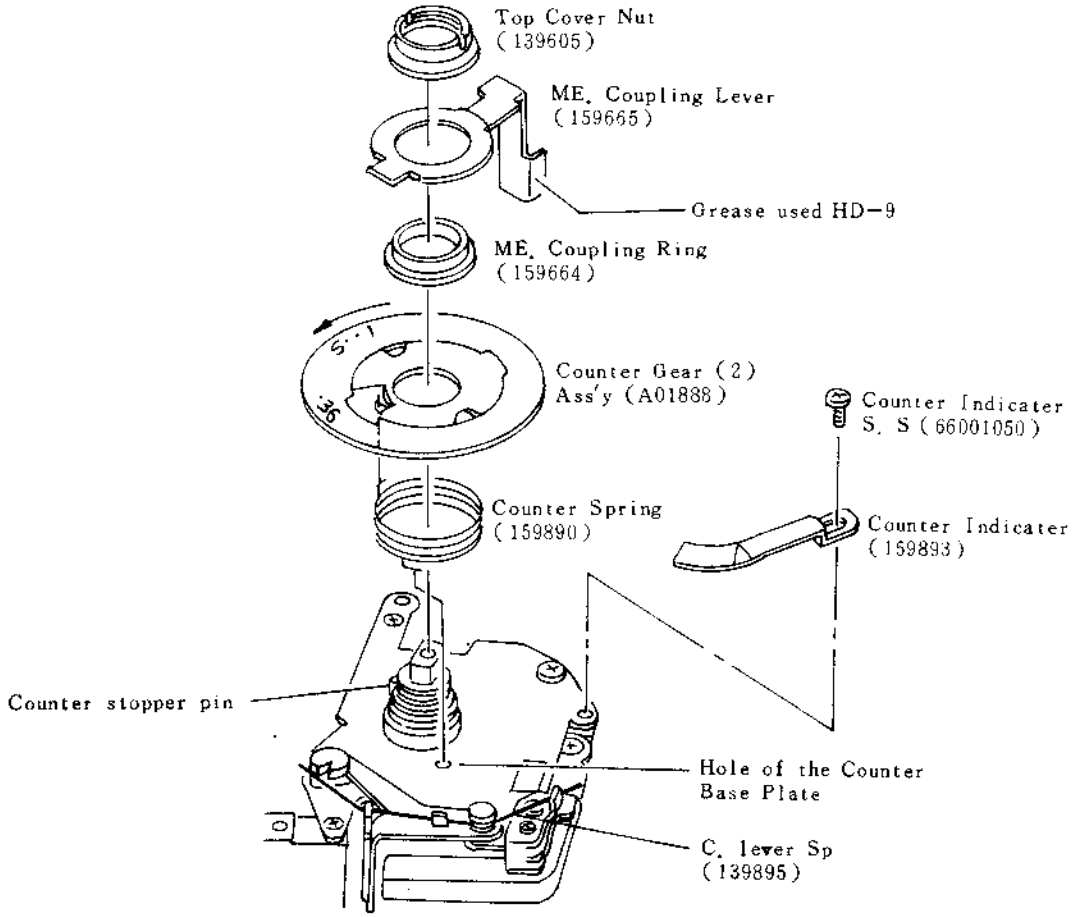


Fig 44

〔FCT Mechanism (Blank Exposure)〕

※ FCT·····Film Count

When blank exposures are being made before the exposure counter reaches " 1 ", the camera shutter will release at 1/100 sec. regardless of the selected shutter speed (except "B") setting, and the shutter speed LED within the viewfinder display will pulsate at " 125 ".
When the counter reaches " 1 ", the camera will automatically switch to the selected exposure mode.

(Position of FCT Mechanism)

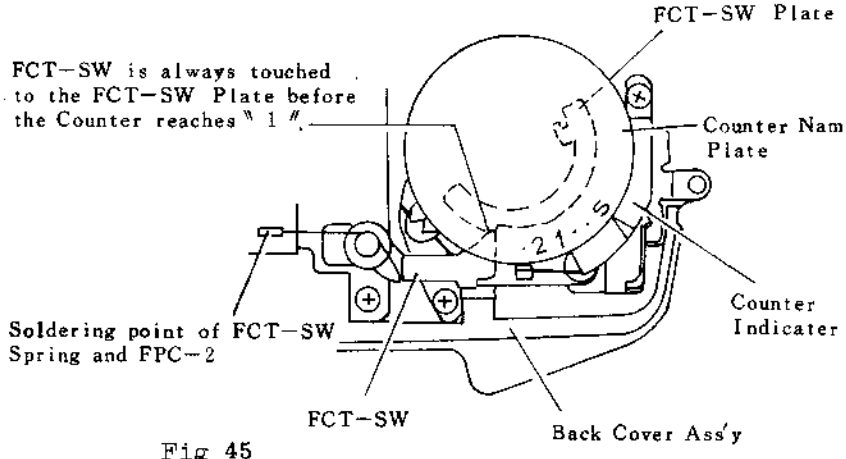


Fig 45

(Position of Counter reaches " 1 ")

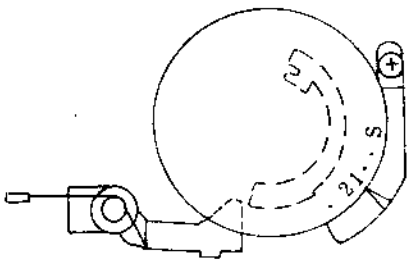


Fig 46

(5) Adjustment of TF-Switch

a) After winding, return the Winding Lever slowly and check that the point of the Winding Obstruction Lever Ass'y is located at position Ⓑ of the Winding Obstruction When the contact part of the Winding Obstruction Lever Ass'y contact is located at position Ⓐ as shown in (Fig 47).

b) The position Ⓐ is the pattern of FPC-2, so it is available switch ON or switch OFF.

c) Adjust the position of pattern of FPC-2 so that you may be able to release the Shutter surely when the point of the Winding Obstruction Lever Ass'y is located at position Ⓑ

Note:

a) Never change the shape of the contact of Winding Obstruction and be careful of the contact pressure especialy.

b) Be careful of the dirt of the contact and the pattern of FPC-2.

c) The Winding Obstruction Lever must be operated surely without shaking or sticking.

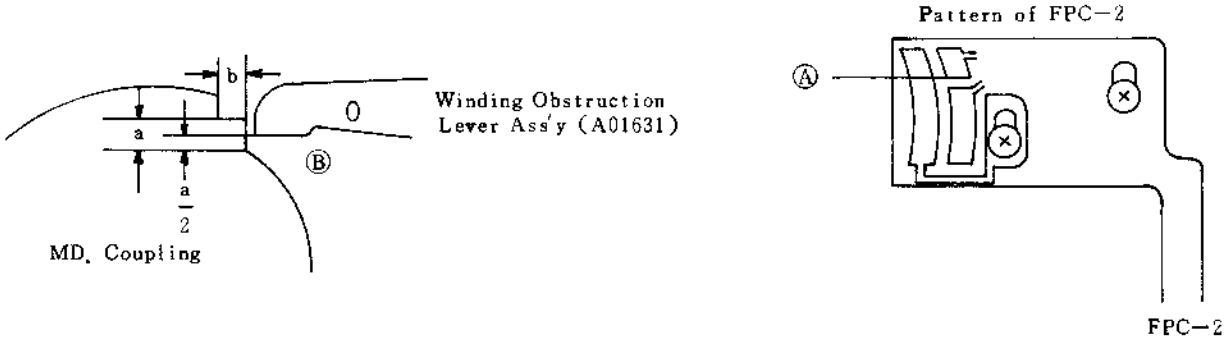


Fig 47

6. REPLACEMENT PROCEDURE OF AMP Ass'Y AND ISO BASE PLATE Ass'Y W/FPC -2.

(Voltage Check & Adjustment)

(1) Disassembling of the AMP Ass'y and ISO Base Plate Ass'y W/FPC-2.

a) Disassemble the exteriro parts.
(See " 1 DISASSEMBLING OF THE EXTERIOR PARTS " page on 4 ~ 7).

b) Unsolder lead wires.
(See " 2 DISASSEMBLING OF THE MIRROR BOX Ass'Y from the camera body " page on 8 ~ 11).

c) Unsolder Orange, Yellow and Green lead wires (from P LED Base) on the right side of camera body.
Unsolder Black and White lead wires (from Theta Base) on the right side of camera body.

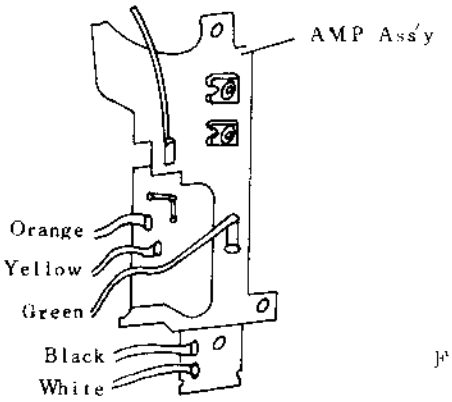


Fig 48

(On the right side of camera body)

d) Unsolder Pink and Bule lead wires (from R-Mg) on the left side of camera body.

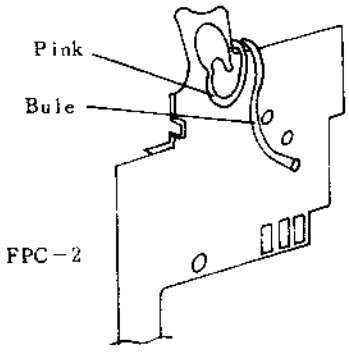


Fig 49

(On the left side of camera body)

e) Remove two FD Mirror Holder Set Screws (61913026 × 2) and FD Mirror Holder Ass'y (A01841).

f) Unsolder Brown, Red, Orange and Yellow lead wires (from F.Stop Code Base).

g) Unsolder Purpul, Gray, Blue, White and Green lead wires (from F. Code Base).

h) Unsolder soldering points of AMP Ass'y and FPC－2.

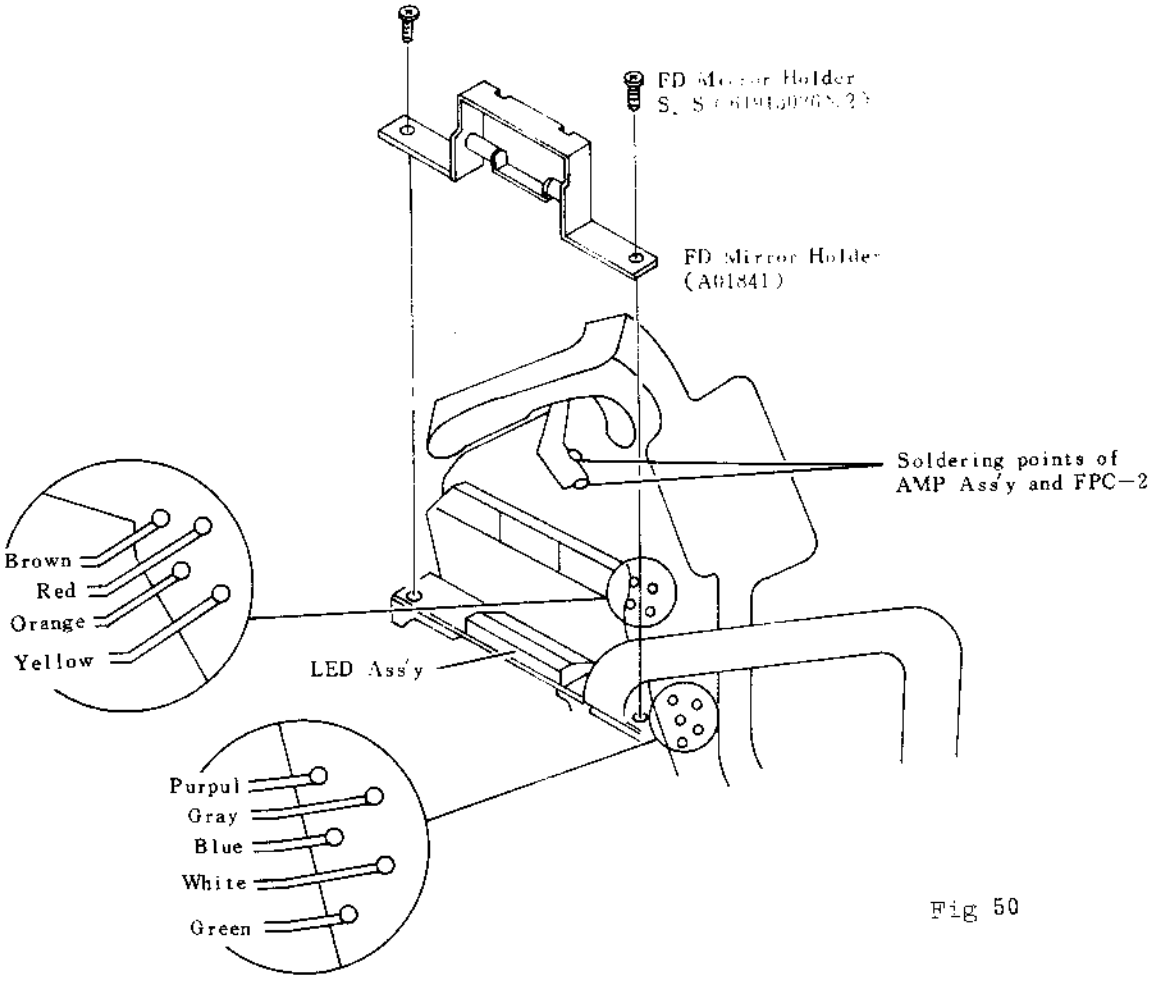


Fig 50

i) Remove the respective parts ①～④ shown in (Fig 51) in numerical order.

〔Note for disassembling〕

a) Never touch the Elastic Connector (141540) with hand (finger) directly during the repair.

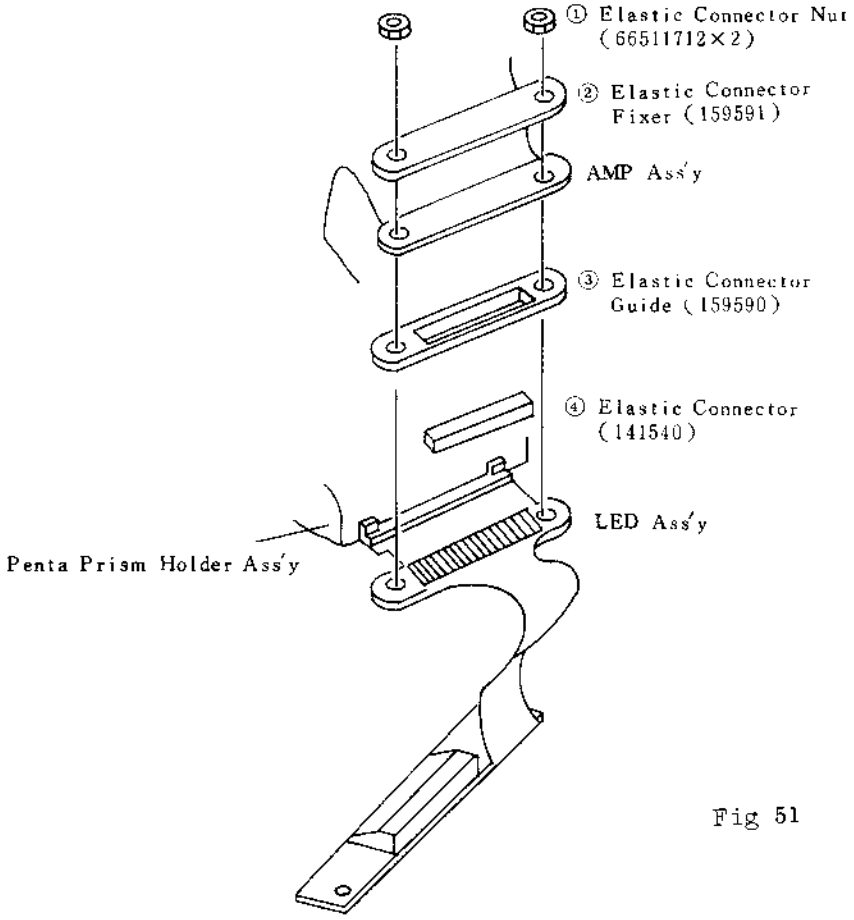


Fig 51

j) Slide the Tube (3) (Yellow) (159599) and unsolder Earth of Shielded wire (from SPD-2 Base).
Slide the Tube (1) (Green) (159597) and unsolder White of Shielded wire (from SPD-2 Base).

k) Unsolder Sky Blue lead wire (from AMP Ass'y) on the Synchro Base and three soldering points of AMP Ass'y and FPC-2.

l) Remove two SPD-E Base Set Screws (61912522×2).
See (Fig 52)

〔Note for reassembling〕

a) Before solder Earth of Shielded wire with Black lead wire and White of Shielded wire with Green lead wire, make sure to clean lead wires with Ether-Alcohol.

b) Keep clean the Tube (3) and Tube (1).
If the Tube is dirty, replace with a new one.

c) Never touch the SPD-E Base with hand (finger) directly during the repair.
If the lead wires, Tube or SPD-E Base is dirty, defect of response when high intensity.

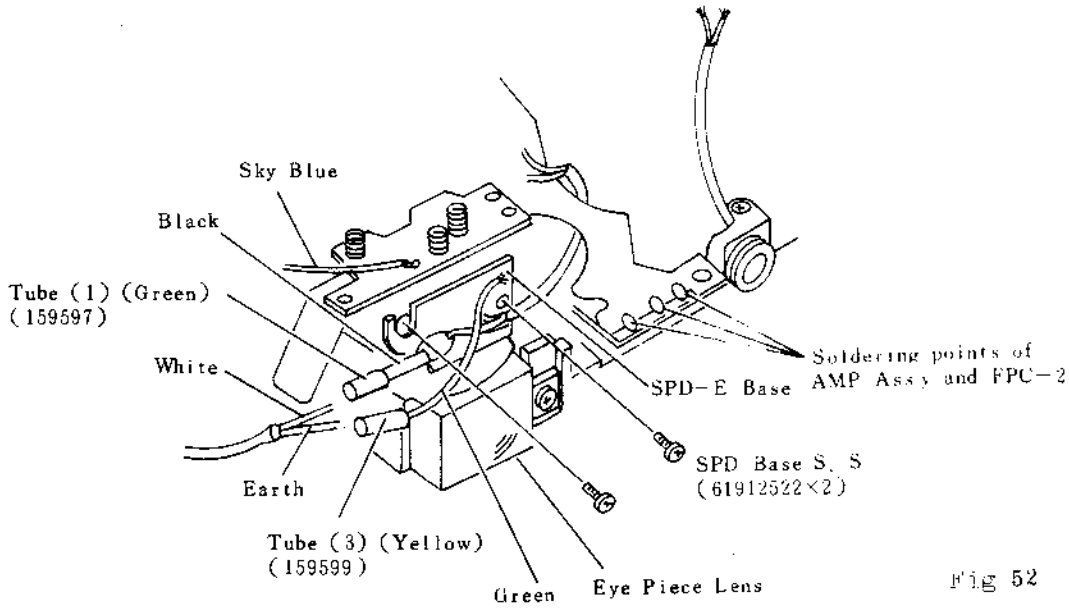


Fig 52

m) Remove the respective parts ① ~ ④ shown in (Fig 53) in numerical order.

〔Note for disassembling〕

a) Pay attention to the Steel Ball (66701520) which fall easily when ISO Dial Shaft Ass'y is removed.

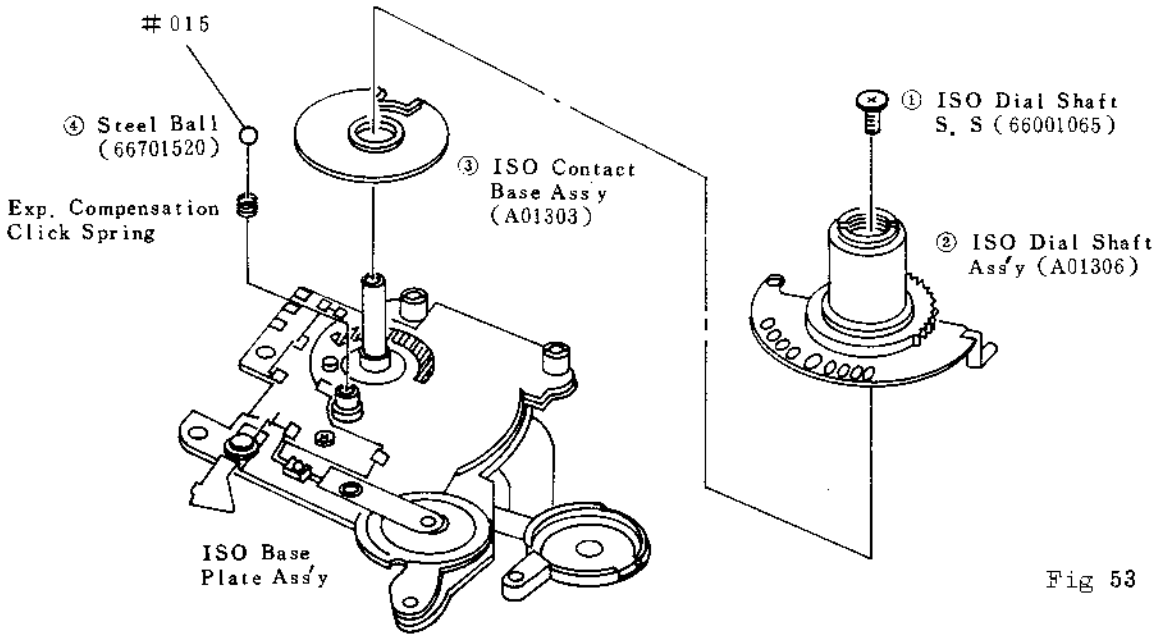


Fig 53

n) Remove the respective parts ① ~ ⑤ shown in (Fig 54) in numerical order.

〔Note for disassembling〕

a) Never touch the ISO Elastic Connector (159530) with hand (finger) directly during the repair.

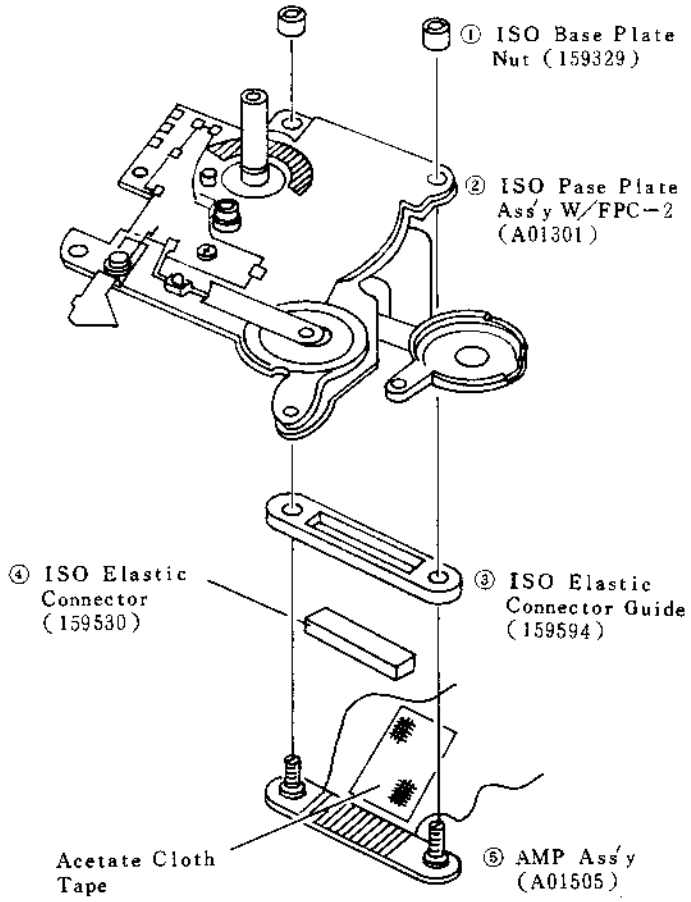

① ISO Base Plate Nut (159329)
② ISO Pase Plate Ass'y W/FPC-2 (A01301)
④ ISO Elastic Connector (159530)
③ ISO Elastic Connector Guide (159594)
Acetate Cloth Tape
⑤ AMP Ass'y (A01505)

Fig 54

(2) Forming of AMP Ass'y and FPC-2

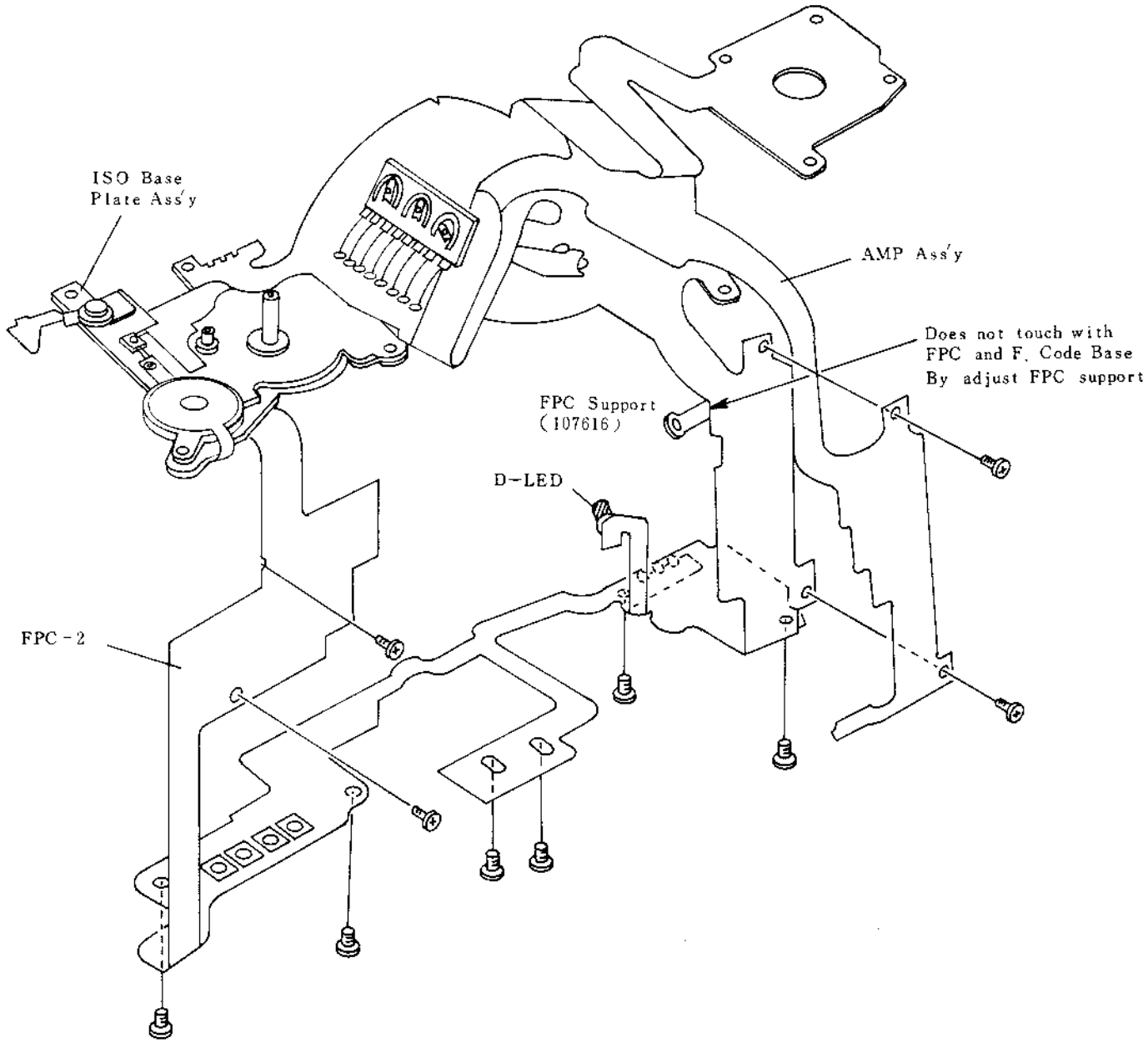


Fig 55

(3) Voltage Check and Adjustment.

(Offset Voltage, Standard Voltage and Battery Check)

〔 Infomation 〕

The principal voltages for balancing the electrnic circuit including voltages mentioned have been correctly adjusted already when the Amplifier Ass'y has been assembled in the factory, spare parts as well.

Preparation before checking.

a) Use the digital multimeter that input inpedance is more than 10MΩ
b) Without Lens
c) Supply about 2.8 volts from Regulated D. C Power Supply, and insert dummy battery to the camera body.
d) Charge the Shutter and release button is pressed partway.

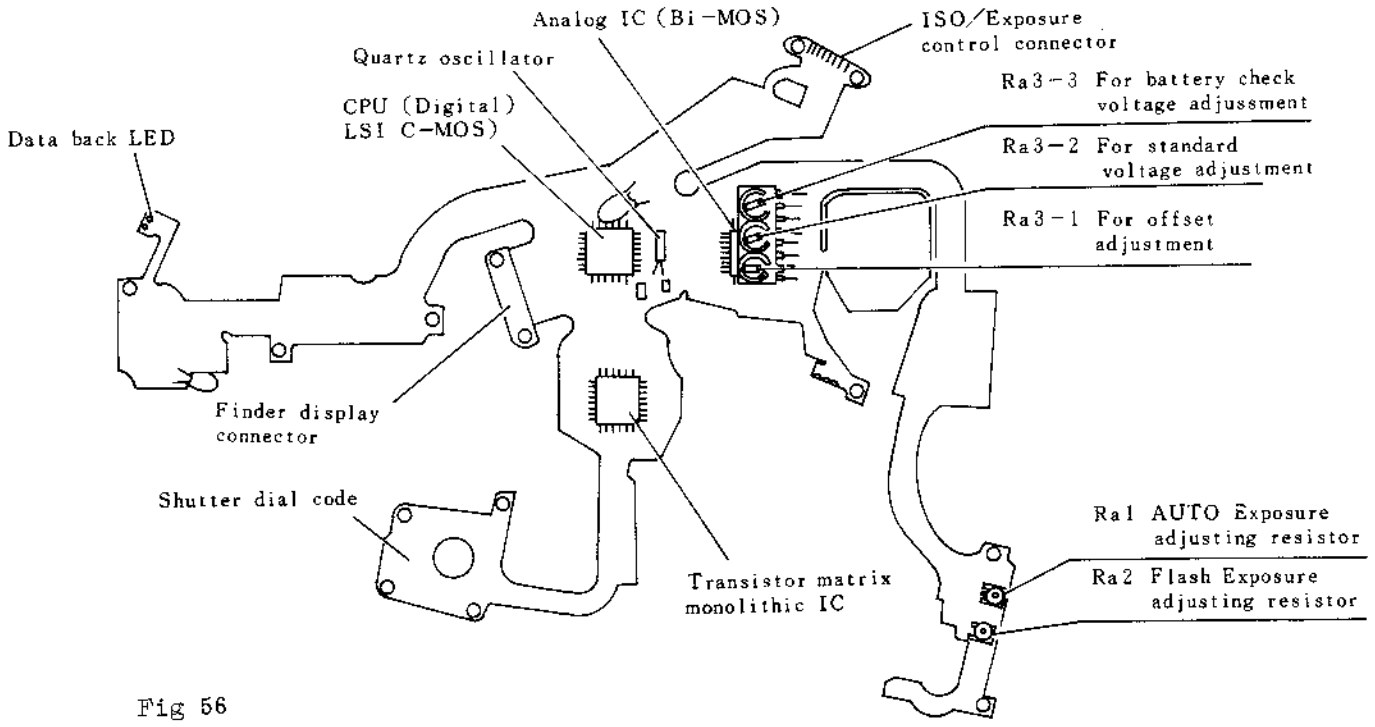


Fig 56

A) Offset Voltage Adjustment.

① Measurement should be made by exposing to light of more than LV15.

② Connect (+) of digital multimeter to Cothode side of SPD-1, (-) of digital multimeter to Anode side of SPD-1 and then read the voltage, See (Fig 57).

The voltage should be 3 ~ 7 mV.

When the adjustment is required, adjust it with the semi-fixed resistor Ra3-1

Note: If maladjusted of Offset Voltage, it is uneveness of exposure when low (high) temperature or low (high) intensity.

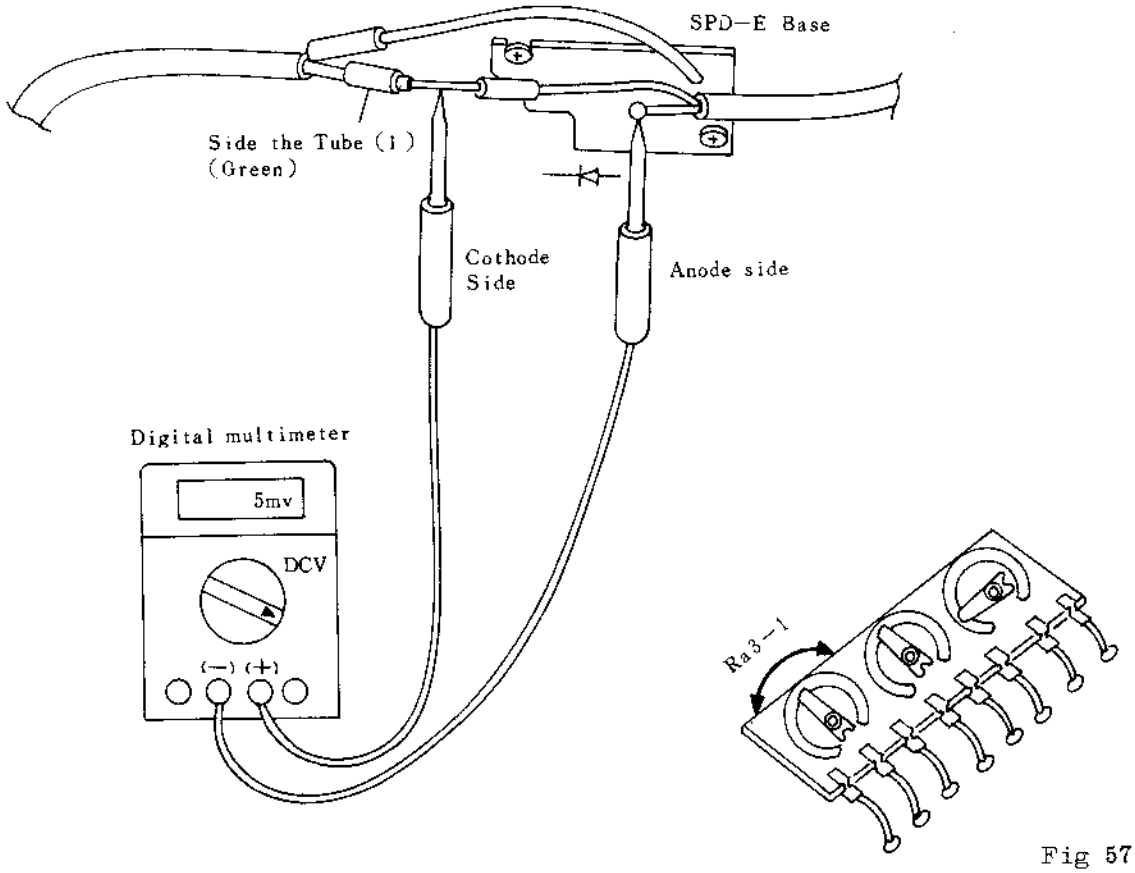


Fig 57

B) Standard Voltage Adjustment.

① Set the position of ISO 100 as shown in (Fig 2).

② Connect (+) of digital multimeter to Vr1, (−) of digital multimeter to Vs, and then read the voltage. See (Fig 58)

The voltage should be 720 ±3 mV.

When the adjustment is required, adjust it with the semi − fixed resistor Ra3 − 2

Note: If maladjusted of Standard Voltage, it not good for Auto Exposure.

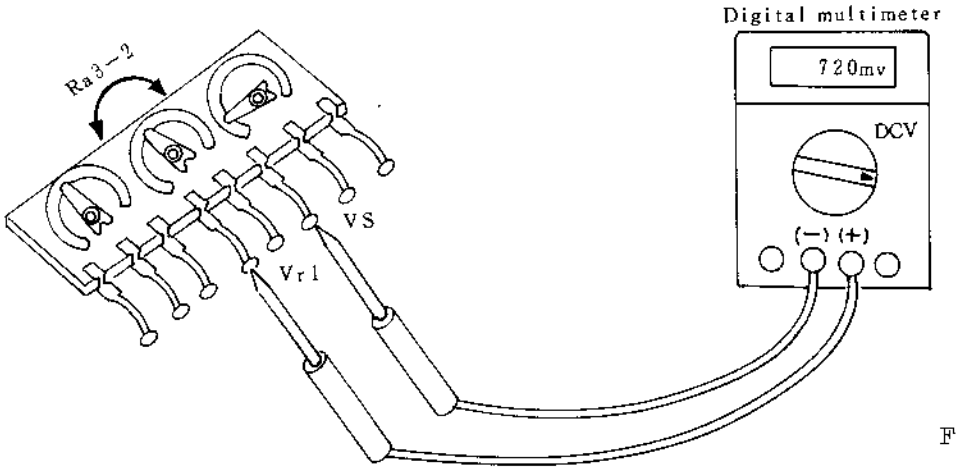


Fig 58

C) Voltage check of VA−Vs

① Set the position of ISO 100

② Connect (+) of digital multimeter to VA, (−) of digital multimeter to Vs, and then read the voltage.

The voltage should be 180 mv

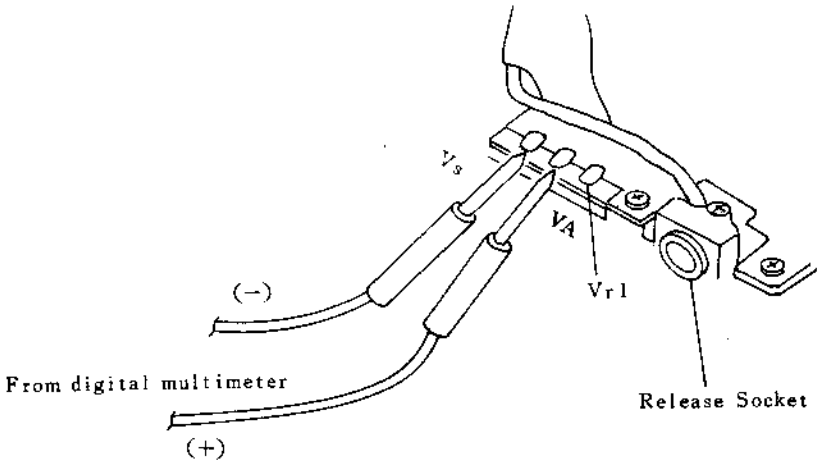


Fig 59

D) Battery Check Adjustment.

① Connect the camera body, Regulated DC Power Supply.
The adjustment should be performed while changing the Power Source Voltage.

Power Soure Voltage	Performance of Battery Check LED
2.5 Volts	LED (red) lights up continuously
2.3~2.45 Volts	LED (red) lights flickeringly
Less than 2.25 Volts	LED (red) does not light at all

When the adjustment is required, adjust it with the Semi - fixed resistor Ra3 - 3

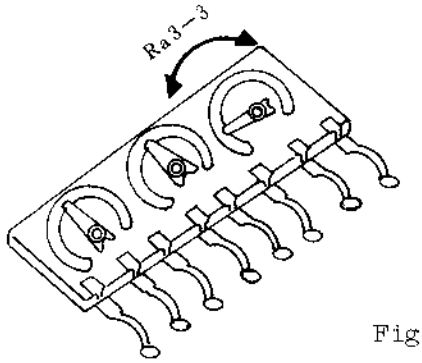


Fig 60

E) Battery Power Consumption.

Conditions	Electrie current reading
Main Switch OFF	0A
Main Switch ON	Less than 10μA
S-LED light up or Shutter is functioned	About 10mA

Connect the camera body, Regulated DC Power Supply at 2.8V and Ammeter

Old Type of AMP Ass'y

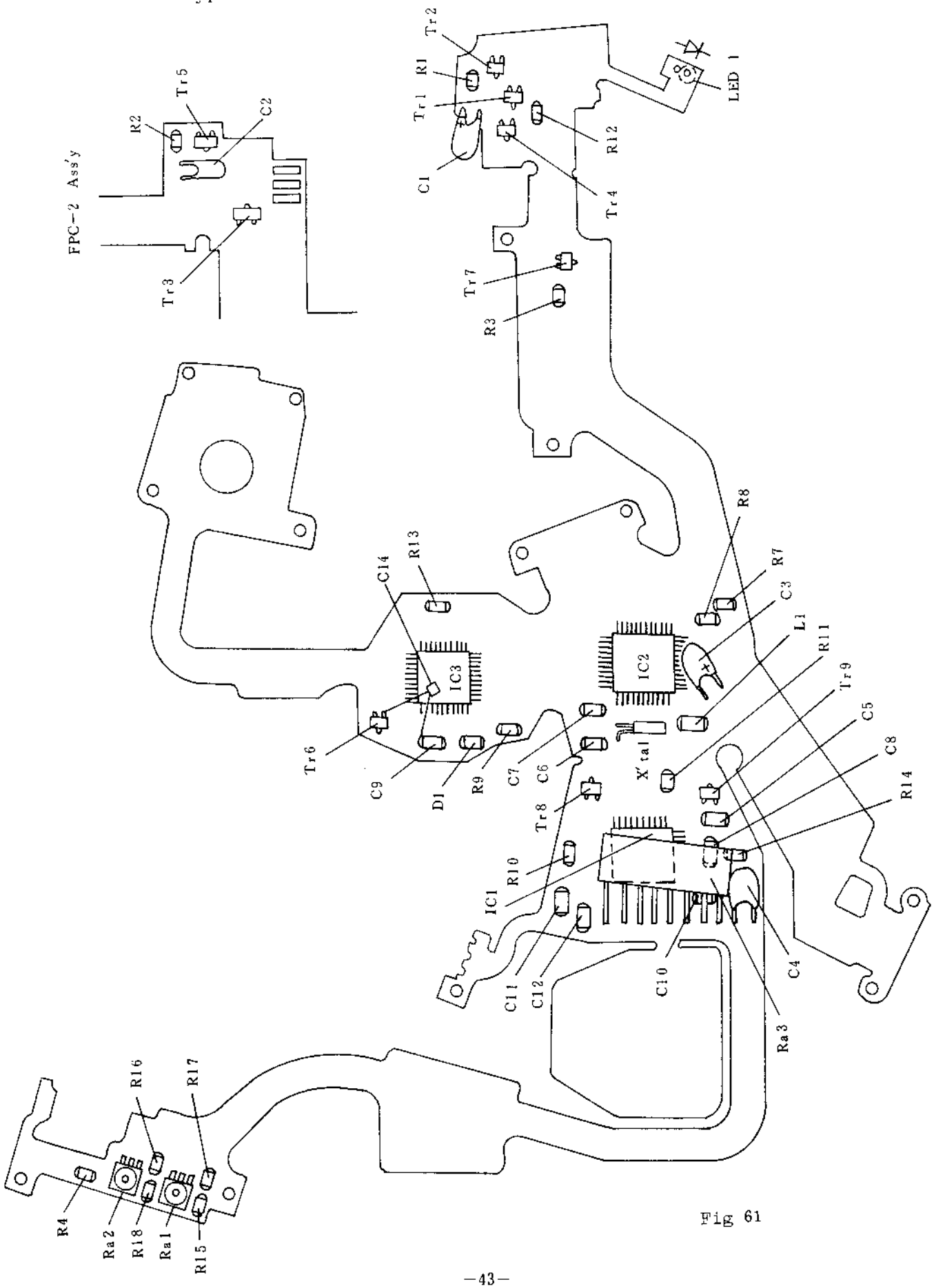


Fig 61

New Type of AMP Ass'y

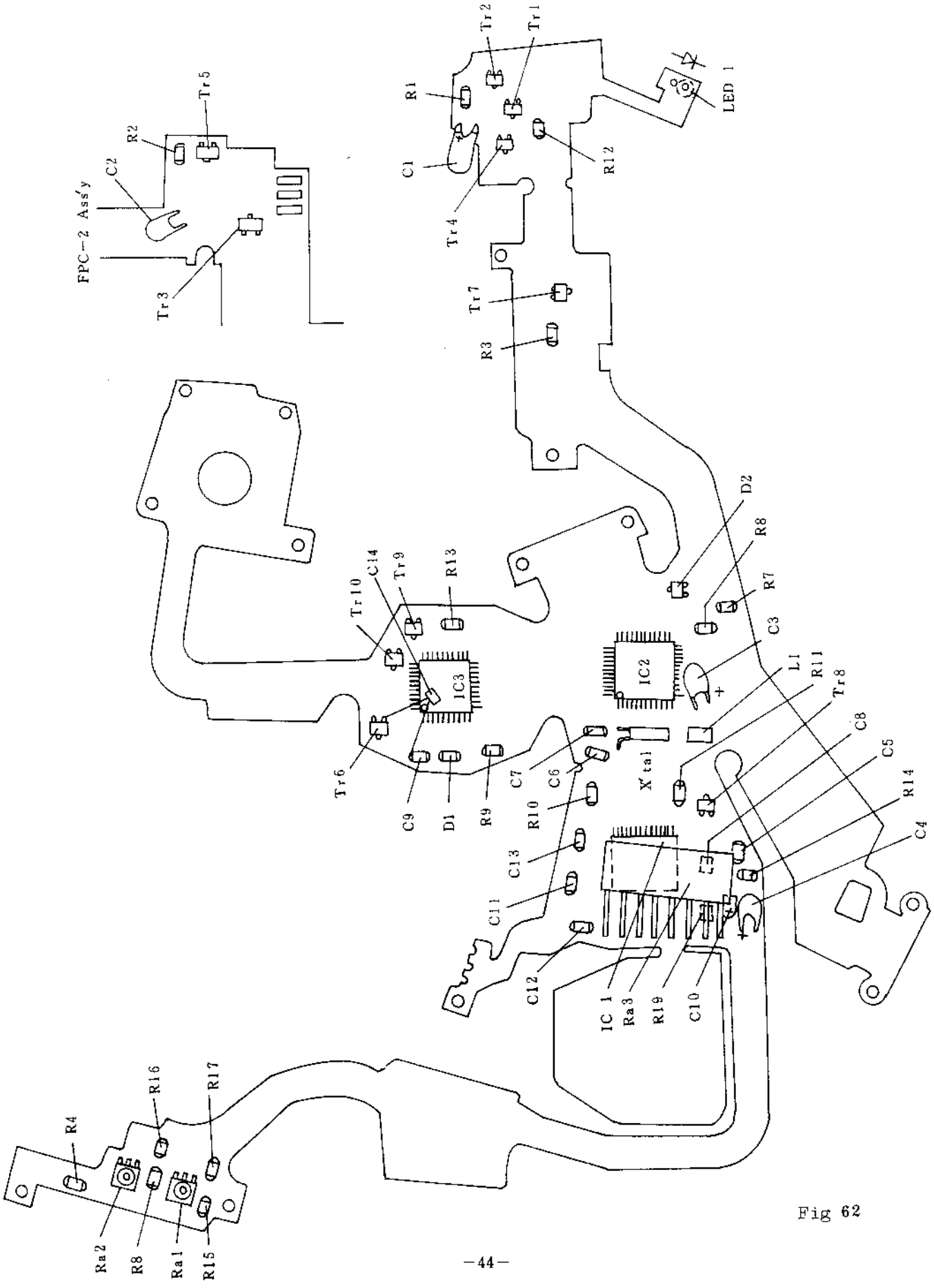


Fig 62

Code	Standard	Performance
C1	100 μF	Power soure condenser for AC—Mg
C2	100 μF	Power soure condenser for R—Mg
C3, C4	100 μF	Power soure filter
C5	0.1 μF	For 1/250 shutter speed retardation
C6, C7	10 PF	Standard oscillation at 32KHZ
C8	0.1 μF	For double intergration
C9, C10	0.15 μF	For power source stability
C11	680 PF	Flash light current intergration
C12	10 PF	Oscillation prevention (feed back)
C13	0.15 μF	Stability of exposure metering
C14	0.15 μF	Stability of Vs power source at low temperature
Tr1	8I	AC—Mg drive (two steps)
Tr2	M6	AC—Mg drive (one step)
Tr3	8I	R—Mg drive (two steps)
Tr4	M6	R—Mg drive (one step)
Tr5	M6	ST—Mg drive
Tr6	L7	For power hold
Tr7	L7	P—LED drive
Tr8	6C	Correction of exposure metering timing
Tr9, Tr10	6C, 8C	Stability of exposur metering at HP and LP
D1	M221	CH voltage limiting
D2	8C	Prevention of Flash mark mismotion when B. C ON
R1	1KΩ	AC—Mg current limiting
R2	1KΩ	R—Mg current limiting
R3	560Ω	P—LED current limiting
R4	1KΩ	Conversion of P Tr signal
R7	180Ω	Load resistance for B. C
R8	100KΩ	For initiallis reset
R9	2KΩ	CH current limiting
R10	62KΩ	Stability of pulse when P—LED output
R11	47KΩ	Exposure metering current limiting
R12	560Ω	Flash mark current limiting
R14	12KΩ	For shutter speed retardation
R15	4.3KΩ	For adjustment of Auto exposure
R16	24KΩ	For adjustment of Auto exposure
R17	4.3KΩ	For adjustment of Flash exposure
R18	30KΩ	For adjustment of Flash exposure
Ra1	22KΩ	Adjustment of Auto exposure
Ra2	15KΩ	Adjustment of Flash exposure
Ra3	Semi—fixed resistor block	Voltage adjustment (Offset, Standard, B. C)
L1	470 μF	Filter of power soure
IC1		Analog IC (Bi—MOS)
IC2		CPU Digital LSI (C—MOS)
IC3		Transistor matrix monolithic IC
X' tal	Quarte	Crystal oscillation

7. DISASSEMBLING OF THE PENTA PRISM AND FINDER FOCUS ADJUSTMENT.

(1) Disassembling of Penta Prism

a) Remove Four Pentaprism Holder Set Screws (63913026×4) and Penta Prism Holder Ass'y frome the Mirror Box Ass'y

〔Note for disassembling of the Penta Prism Holder Ass'y
Pay attention to the Focusing Adjusting Washers located bettween Penta Prism Holder Ass'y and Mirror Box.

b) Remove the Penta Prism Fixer, Penta Cover, Penta Dust－Proof Moqutte (139858) and Mirror Cushoion (131710×2).

c) Remove the shielding adhesive from around the Penta Prism as shown in (Fig 63).

d) Remove the Penta Prism.

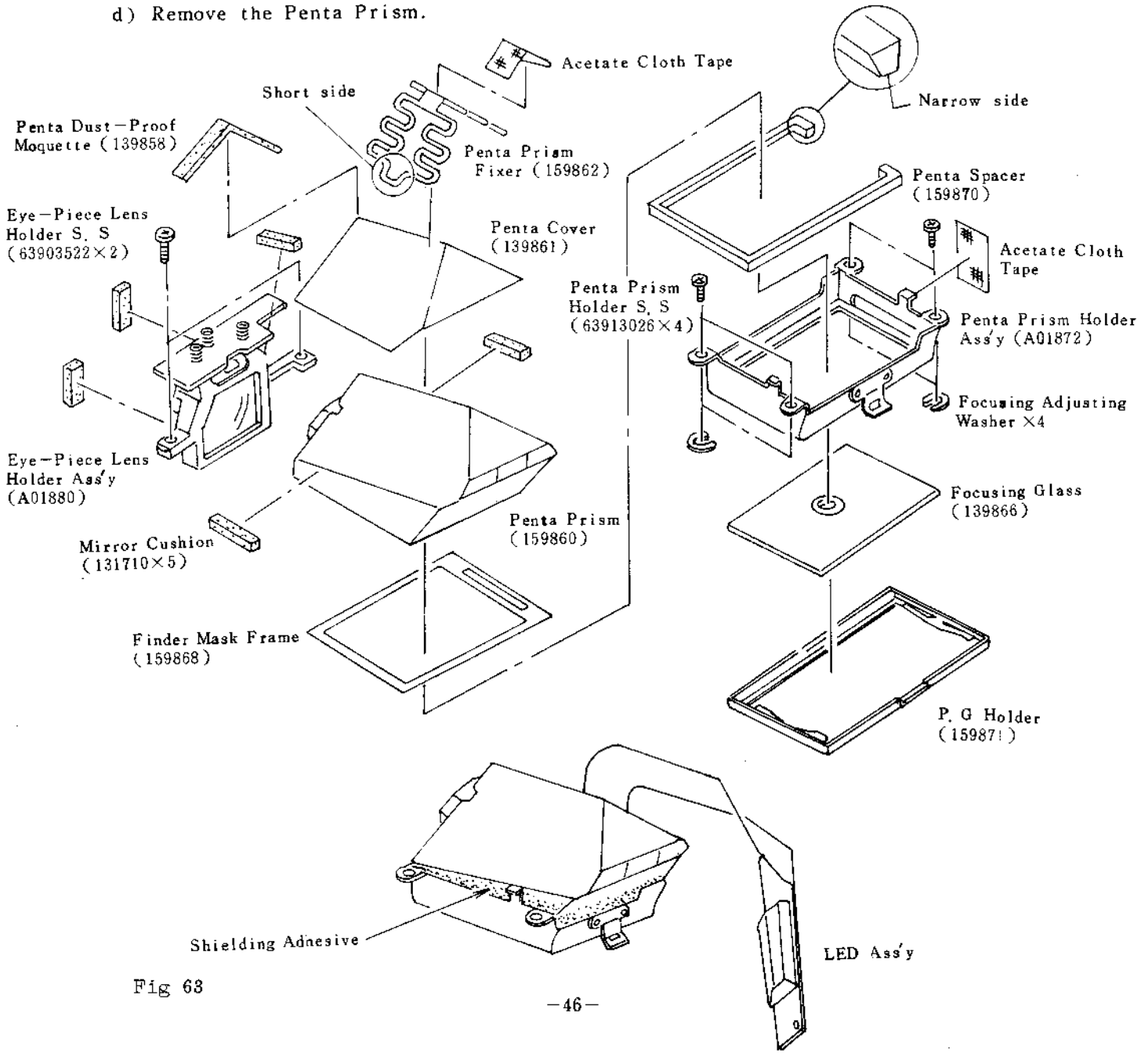


Fig 63

(2) Reassembling of LED Ass'y.

a) Insert the LED Ass'y into the Penta Prism Holder Ass'y.
b) Apply Cemedine 551A around the upper part of LED Frame as shown below.
c) Hold bettween the Penta Prism Holder and LED Frame with clothespin.
d) Apply Sun-coat adhesive around the bottom side of LED Frame as shown below and dry it for about 30 minutes.

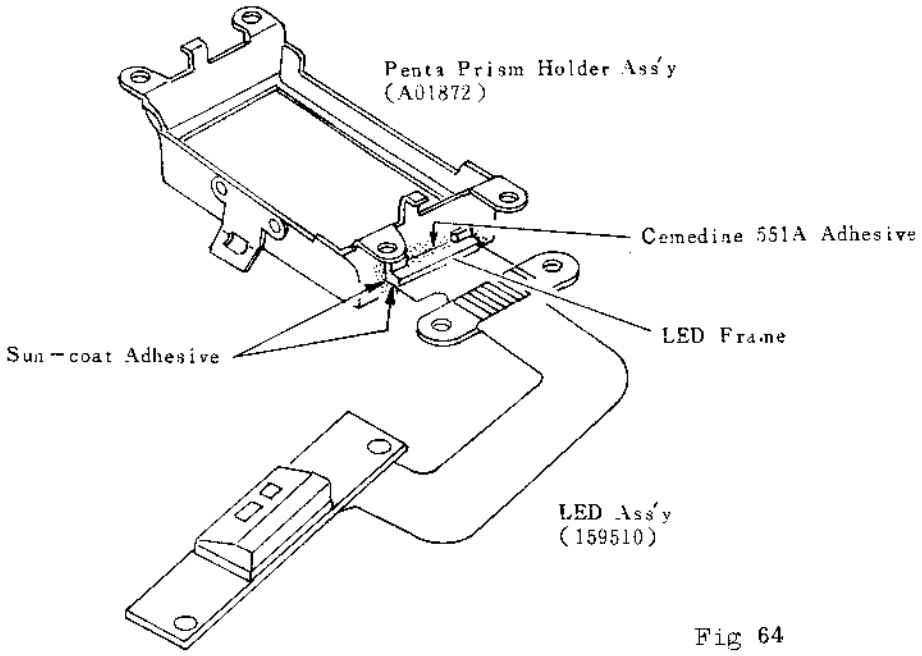


Fig 64

(3) Aperture Display Adjustment.

The position of Aperture display shall be adjusted so that can normally be seen in the viewfinder.

Loosening the FD Mirror Holder Set Screw and adjust position of FD Mirror.

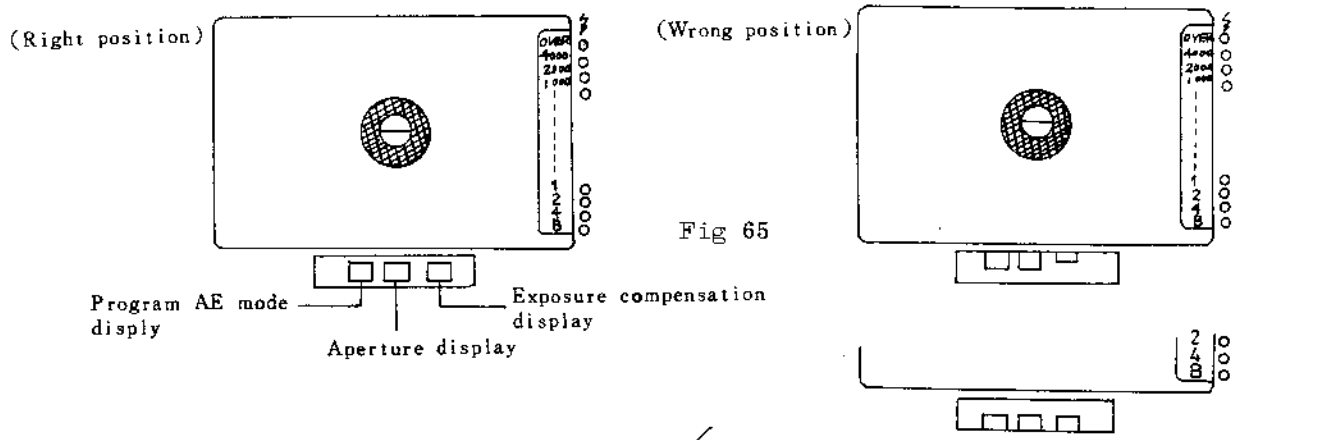
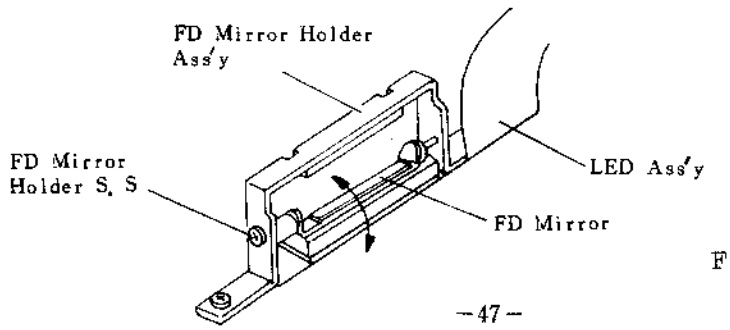


Fig 65



※ FD Mirror Set Screw must be locked with glue after adjustment.

Fig 66

(4) Adjustment of F. stop Code Base Ass'y.

a) Looseening two F. Code Contact Set Screws.
b) Align the notched F. Code Contact with the triangular index (▼) on the F. Stop Code Base.
c) Tighten two F. Code Contact Set Screws.
d) Make sure align the notched F. Code Contact with the triangular index (▼) on the F. Stop Code Base when the F.Stop Plate should normally be returned smooth under spring forces.

Note : Be careful of the dirt of the contact and the pattern of F. Stop Code Base.

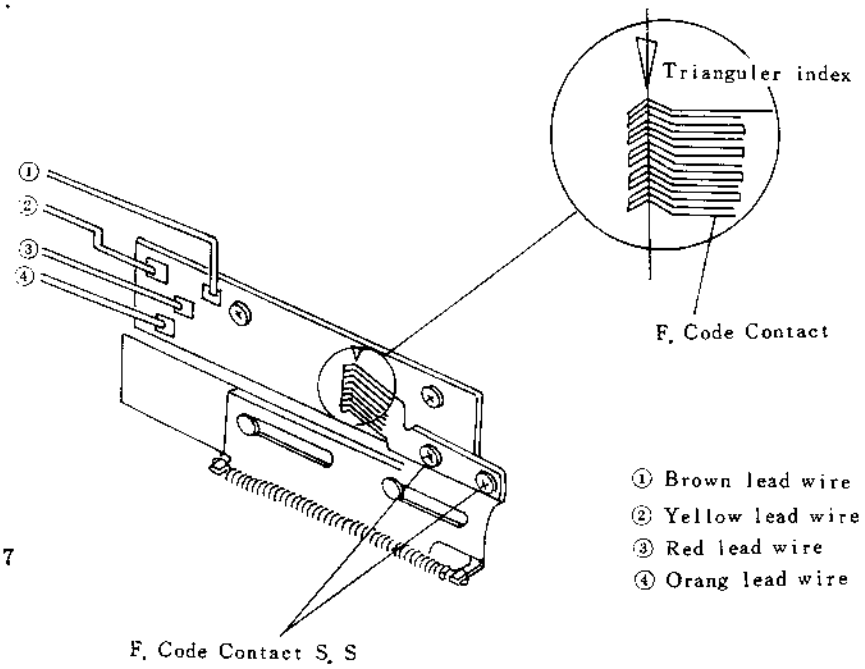


Fig 67

(5) Flange Back distance Adjustment.

o Flange back distance from the Body Mount Plane to film rall Plane.
To adjust flange back, add or reduce whashers.
Two different thickness of adjusting whashers are available.
0.05㎜ (128666), 0.02㎜ (128667)

$$45.42\ ^{+0.02}_{-0.03}\ \text{mm}$$

o Distance from the film rail plane to the pressure plate rail plane.

$$0.2\ \pm 0.02\ \text{mm}$$

(6) Finder Focus Adjustment.

Finder focus error can be determined by the positions of the infinity (∞) symbol and index line on the lens in use.

o Rough adjustment of finder focus.

When the finder focus error is out of " ±1/4 " range (Fig 68) adjust the finder focus by changing the Focusing Adjusting Washers (Fig 63). Six different thickness of Focusing Adjusting Whashers are available, therefore, select the proper one.

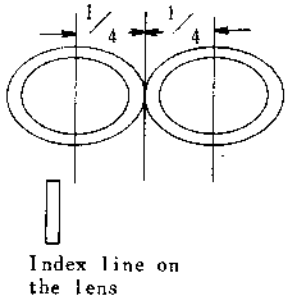


Fig 68

① When the focusing ring is turned and correct focus cannot be abtained at infinity, the finder-back is too long.
In this case reduce (lower) the position of the focusing screen.

② When correct focus can be obtaince when the focusing ring is truned to a position before infinity, the finder-back is too short. In this case, increase (raise) the position of the focusing screen.

o Fine adjustment of finder focus.

When the finder focus error is within the " ±1/4 " range (Fig 69) adjust by turning the Fine finder focus adjusting screw as shown in (Fig 70). This adjustment can be performed from right side of the Mirror Box by removing the Front Cover.

Note : a) Never turn the Fine finder focus adjusting screw over 1 revolution.
b) Operate the shutter release several times without fail after the fine adjustment of finder focus. Confirm the focus once more, and fix that screw with glue.

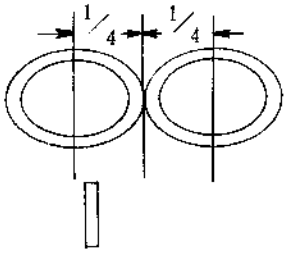


Fig 69

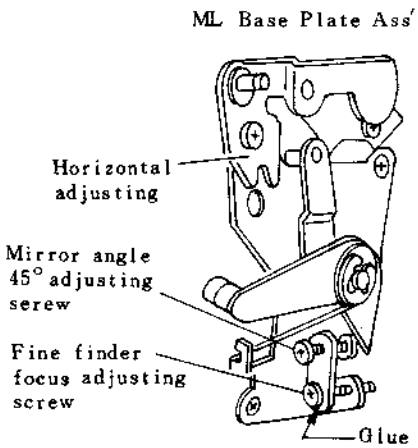


Fig 70

8. EXPOSURE ADJUSTMENT.

(1) The Modified Back Cover (Fig 71)

The modified back cover is required when checking the Automatic Exposure off the film plane with the EE Tester (Multi Camera Tester), or Shutter Curtain Travel Speed or Shutter Speed with the Shutter Tester. With the Contax 159MM camera, when the Back Cover is opened (FCT-SW is turned on with counter · Reverse Lever), the shutter speed is automatically set at 1/100 sec.

Modification.

Cut out the ▨ portion of the used back cover of the Contax 159MM.

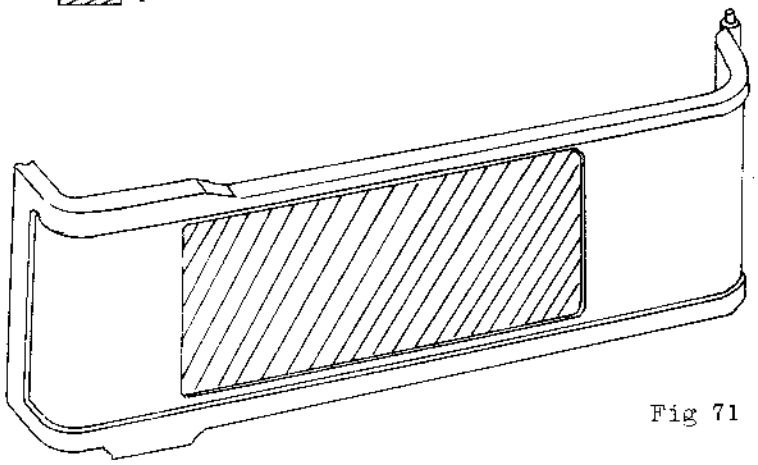


Fig 71

(2) Automatic Exposure Adjustment.

Set the EE Tester (Multi Camera Tester)·····ASA100, K=1.3.

Set the camera to be tested·····Auto, ASA80, F5.6.

Telerance Limit

LV	EV Tolerance	S-LED display
LV 4	-0.60 ~ +0.60EV	2
LV 8	-0.60 ~ +0.60EV	1/8
LV15	-0.60 ~ +0.60EV	1/125
LV15	-0.60 ~ +0.76EV	1/1000

Automatic Exposure can be adjusted by turning the Ra1 Semi-fixed resistor as shown in (Fig 81).

Adjustments can be done by removing the Reinforcement Plate Rubber.

(3) Program Exposure.

<Program AE Mode>

In the Program AE mode, the camera automatically selects the optimum combination of shutter speed and aperture settings for correct exposure according to lighting condition by using its per-programmed matching shutter speed and lens aperture settings.
Optical rotary encoder unit reads calculated aperture value by CPU (Digital LSI C-MOS), and fixs aperture blades on calculated position exactly.
Optical rotary encoder has synchronized turning pulsar with aperture blades between LED and light receiver, CPU calculates light pulse through slit of pulsar, and aperture control magnet (AC Mg) fixs aperture blades.

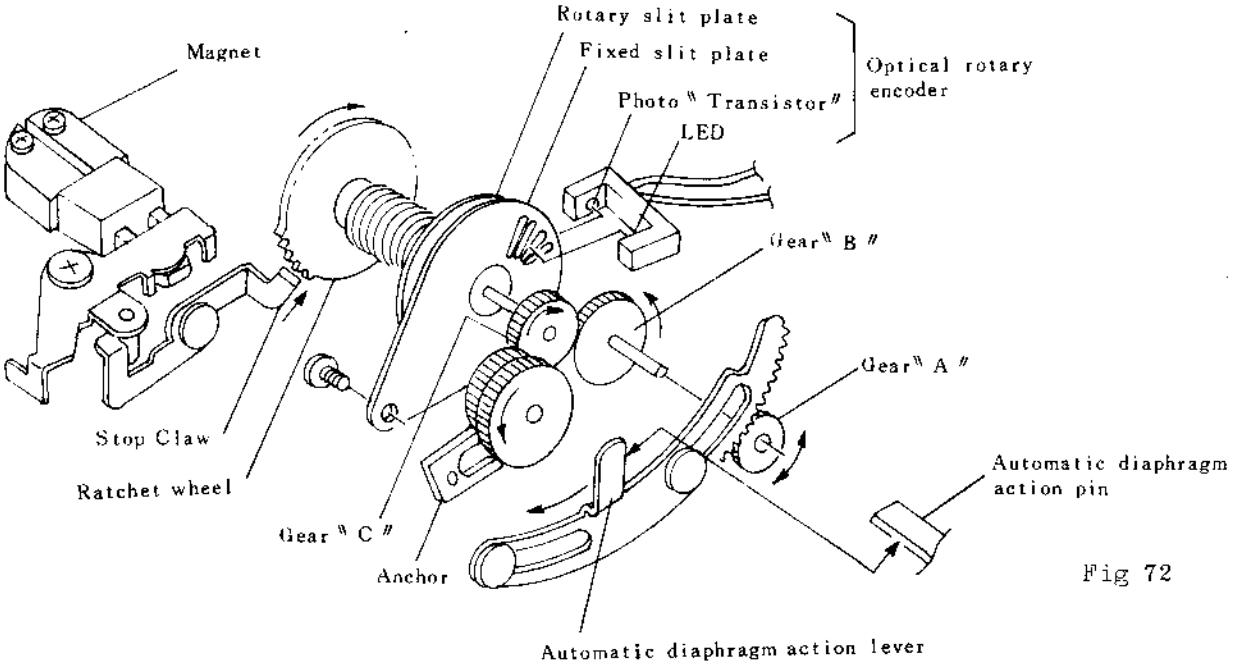
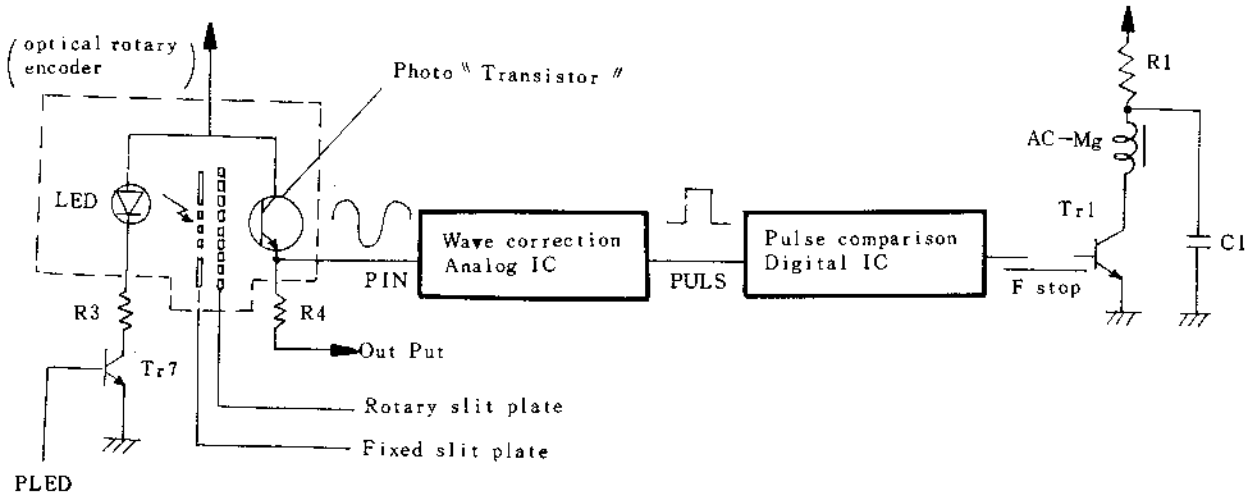
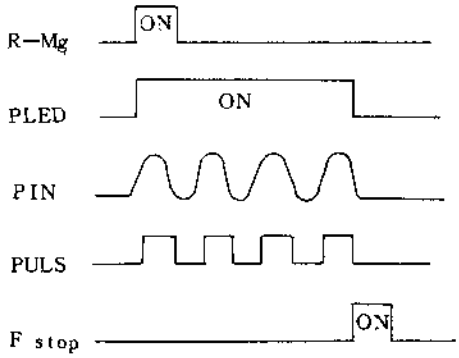


Fig 72

<Programe Operation>

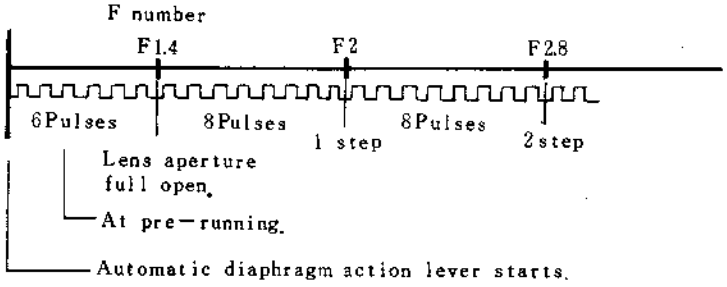
① Mechanism starts operation by release Mg, and Automatic diaphragm action lever begins operation. So Rotary Slit Plate begins turning.
② IC count pulses by turing of Rotary Slit Plate.
③ When pulses count of aperture value for brightness harmonizes with pulses count of encoder, F stop signal should be come and Ratchet wheel should be stopped by operating of AC-Mg.





<Delayed Pulse Adjustment>

In time of program, Tr7 (PLED) should be on (LED ON), and in time of $\overline{\text{F stop}}$ (AC-Mg stops), Tr7 should be OFF (LED OFF).
After giving signal to AC-Mg ($\overline{\text{F stop}}$), adjust the mechanical delay of Automatic diaphragm action lever stop, so you can adjust delayed pulses. Automatic diaphragm action lever is synchronized with encoder, then adjust the mechanism through encoder. In order to do so, keep P LED ON and count pulses from sygnal of $\overline{\text{F stop}}$ till stop of encoder.



- o 8 pulses per 1 step then 1pulse is 1/8 EV (0.125 EV).
- o Pre-running is 6 pulses (Delayed puls).
  If pre-runing is 7 pulses, programe Exposure is under.
- o There are mechanical delay after F stop signal (AC-Mg, Ratchet wheel etc.), then make electric adjustment at pre-running (subtract).

(Adjusting Procedures)

o Setting of Oscilloscope (National VP−5701A)

① Set TIRIGGERING TIME／DIV at 0.5 m sec.
② Set SWEEP MODE at SINGLE.
③ Set SOURCE at CHOP.
④ Set VOLTS／DIV at 0.1V.
⑤ Set VOLTS／DIV at 50mV.
⑥ Set SLOP at (+).

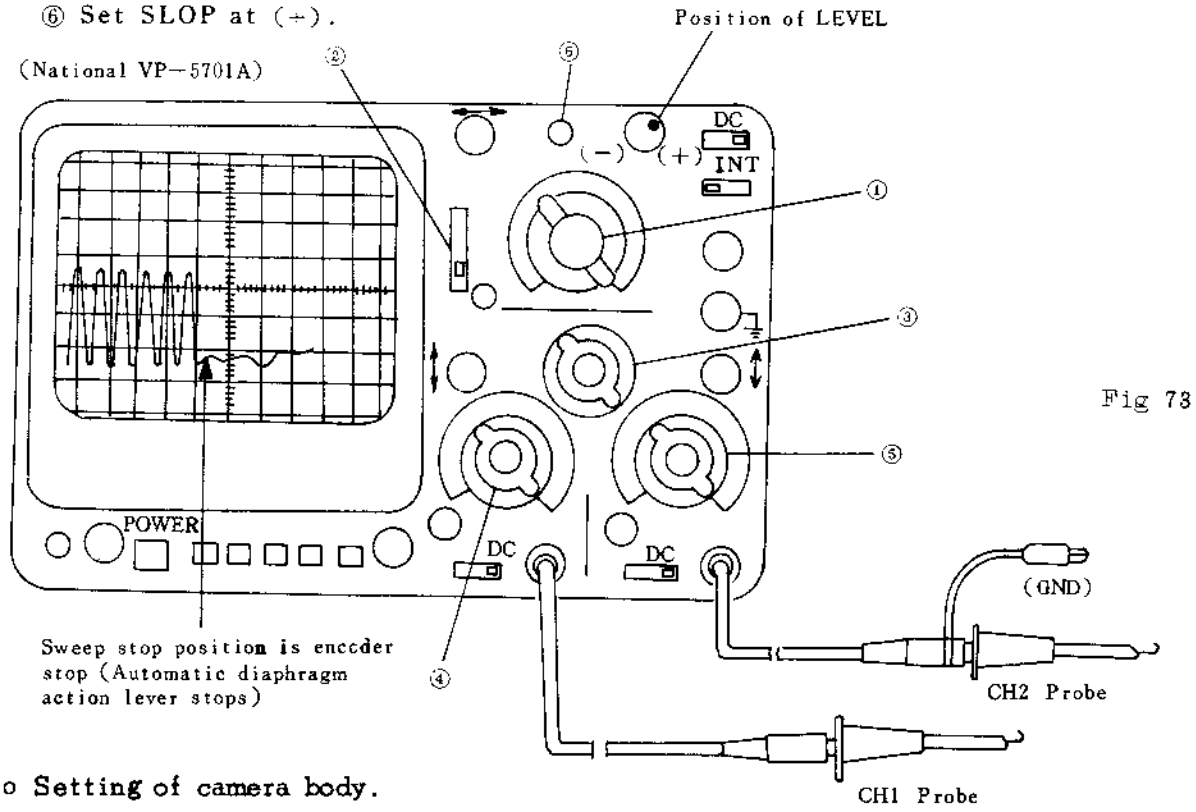


Fig 73

o Setting of camera body.

1. Set S. Click Plate to P position as shown in (Fig 3).
2. Set the MM lens on the camera body.
3. Take off Tr7. (Fig 74).
4. Connect R3 (560 Ω) directly to GND. (Fig 74).
5. Connect the CH 1 probe to Collector of Tr2. (Fig 74).
6. Connect the CH 2 probe to R4 (PIN) and the GND of CH 2 probe to R4 (VS). (Fig 75).

o Adjustment of Delayed Pulses.

1. Place the Shutten in charged condition.
2. Release the Shutter.
3. Read pulses (F stop signal between PIN and VS) on the oscilloscope. Max. 6 pulses within 2 m sec.
4. Re do F 2.8 (LV8) and F 5.6 (LV12) with changing brightness.
5. Adjust delayed pulses (Max. 6 pulses) by turning the AC−Mg adjust screw as shown in (Fig 15).

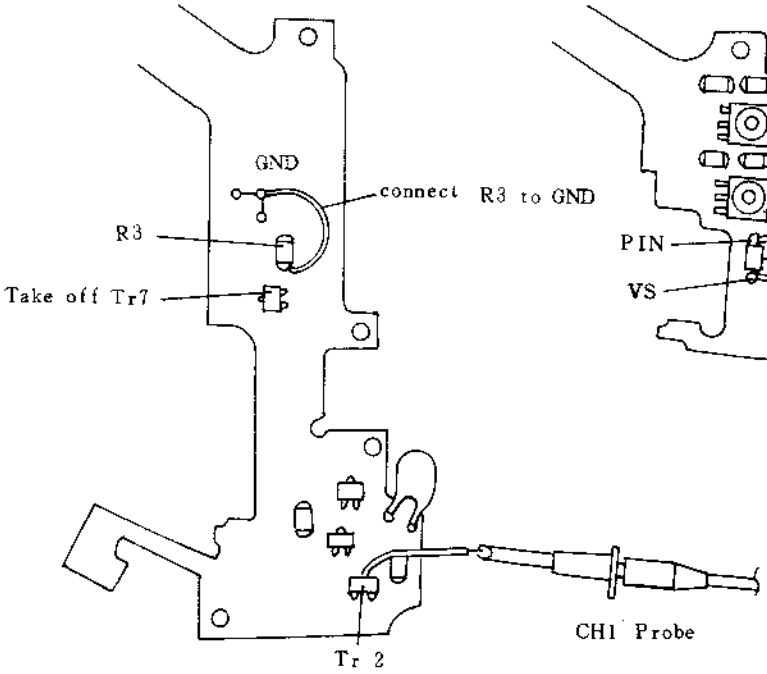


Fig 74

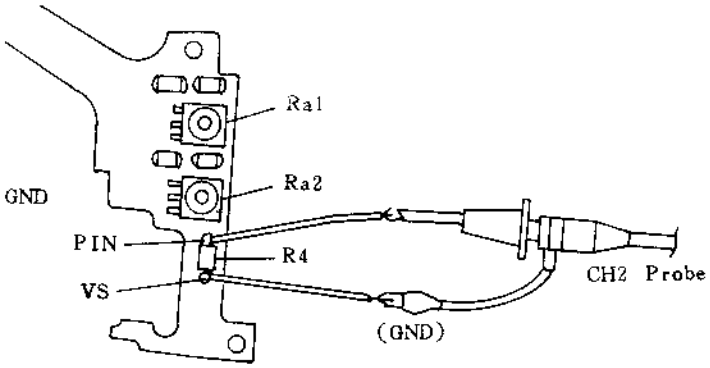


Fig 75

(Check of Encorder Amplitude and Delayed Time.)

o **Setting of Oscilloscope (National VP-5701A)**

① Set TIRIGGERING TIME/DIV at 10m sec.
② Set SWEEP MODE at SINGLE.
③ Set SOURCE at CHOP.
④ Set VOLTS/DIV at 0.1V.
⑤ Set VOLTS/DIV at 20mV.
⑥ Set SLOP at (+).

o **Setting of camera body.**

1. Set S. Click Plate to P position as shown in (Fig 3).
2. Set the MM lens on the camera body.
3. Take off Tr7. (Fig 75).
4. Connect R3 (560Ω) directly to GND. (Fig 75).
5. Unsolder one lead wire of AC-Mg.
6. Connect the CH 1 probe to Collector of Tr4. (Fig 75).
7. Connect the CH 2 probe to R4 (PIN), and the GND of CH 2 probe to R4 (VS). (Fig 76).

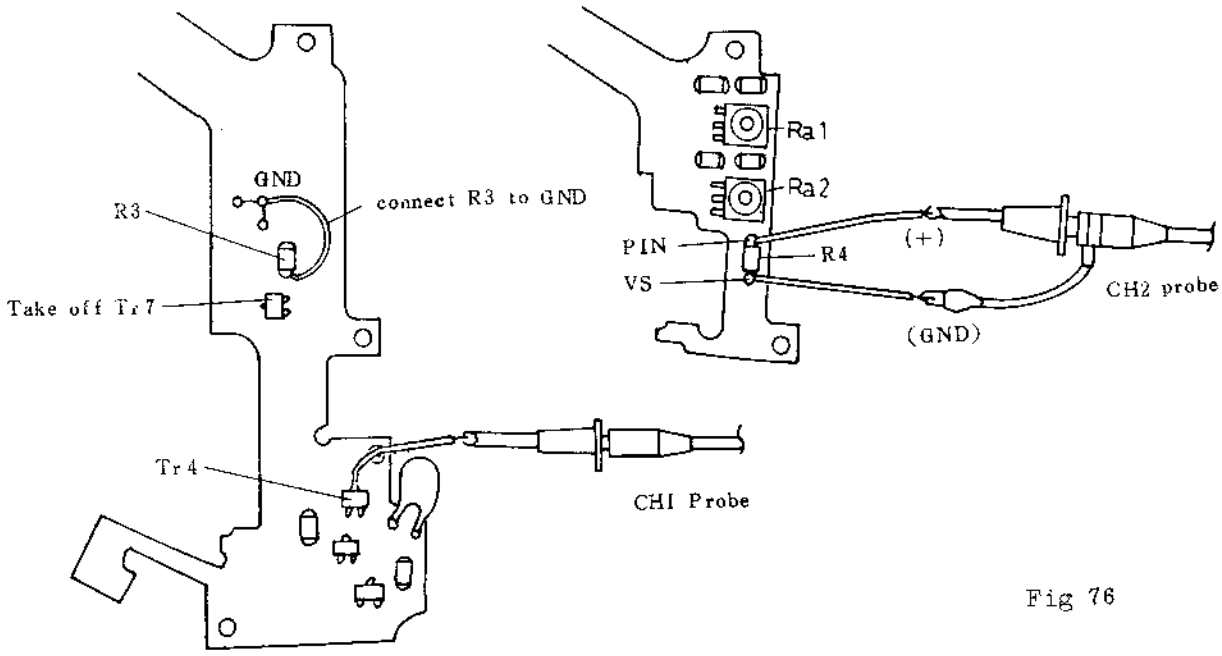


Fig 76

o Check of Encorder Amplitude and Delayed Time.

1. Place the shutter in charged condition.
2. Release the Shutter.
3. Read encorder amplitude on the oscilloscope.

   (L) level ····· under 20mv

   (H) level ····· over 300mv

4. Read delayed time on the oscilloscope.

   40 ~ 50m sec.

※ Encorder meeds about 40 ~ 50ms from aperture full open position to minimum position.

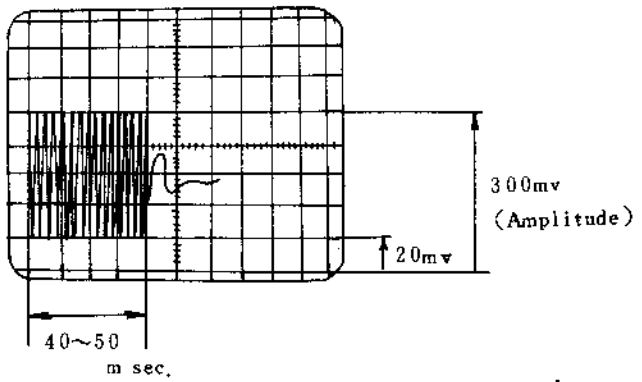


Fig 77

※ If amplitude is too small, IC could not count pulses.

Note : After Delayed Pulse adjustment, check of Encorder Amplitude and Deleyed Time, re-solder the Tr7.

o Check of Program Exposure.

Set the EE Tester (Multi Camera Tester)·····ASA 100, K=1.3.

〃P〃 (Normal Program AE Mode)

Set the camera to be tested·····P, ISO80, MM Lens, F1.6.

LV	S-LED display	Aperture disply
4	8	1.4
8	30	2.8
12	125	5.6
15	500/250	9.5

〃HP〃 (High-speed Program AE Mode)

Set the camera to be tested·····HP, ISO 80, MM Lens, F1.6

LV	S-LED display	Aperture disply
4	8	1.4
8	125	1.4
12	1000	2
15	1000	5.6

〃LP〃 (Low-speed Program AE Mode)

Set the camera to be tested·····LP, ISO 80, MM Lens, F1.6

LV	S-LED display	Aperture disply
4	8	1.4
8	60	2
12	60	8
15	125	16

o Adjustment difference of Program Exposure for Auto Exposure.

※ Differnce of exposure at Auto, P, HP and LP have to be within 0.3EV.

o If P(program) exposure is under for Auto exposure (0.5~0.6EV).
Connect with jumper wire AJ2, GND and AJ1 as shown in (Fig 79).

o If P(program) exposure is over for Auto exposure.
Connect with jumper wire GND and AJ1 as shown in (Fig 80).

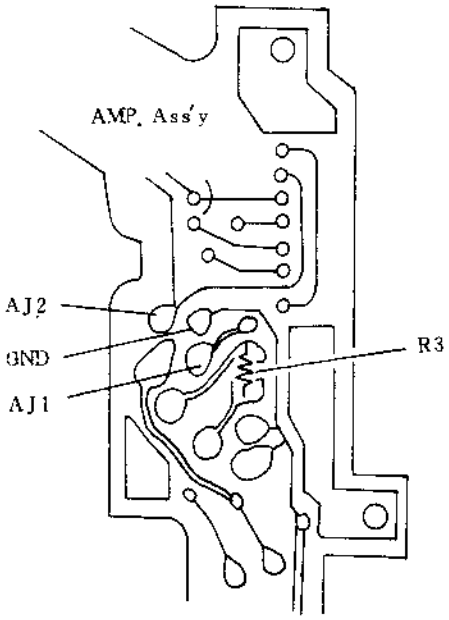


Fig 78

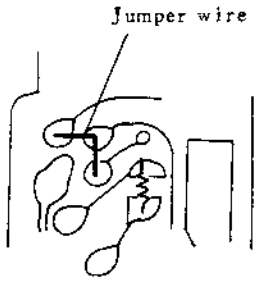


Fig 79

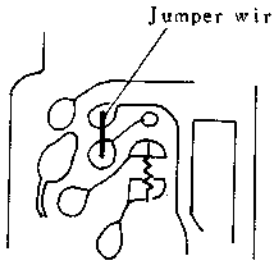


Fig 80

(4) Flash Exposure (Flash Out Put) Adjustment.

Flash Exposure can be checked by Flash Meter.

Adjust the Flash out put to ±0.3 EV at ISO 100, F 5.6 and the distance 2m by turning the Ra2.

(Use same type of Film as coustomer's when checking).

Adjustments can be done by removing the Reinforcement Plate Rubber.

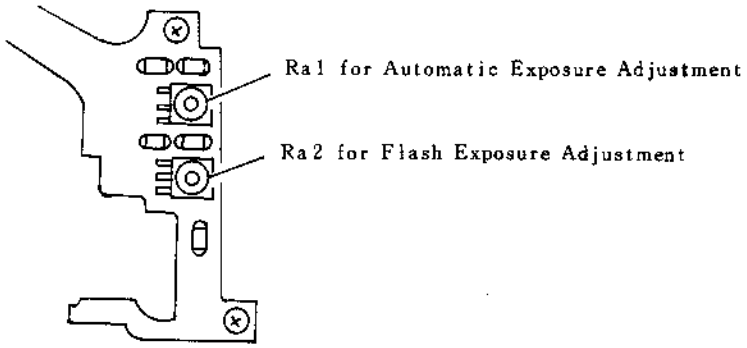
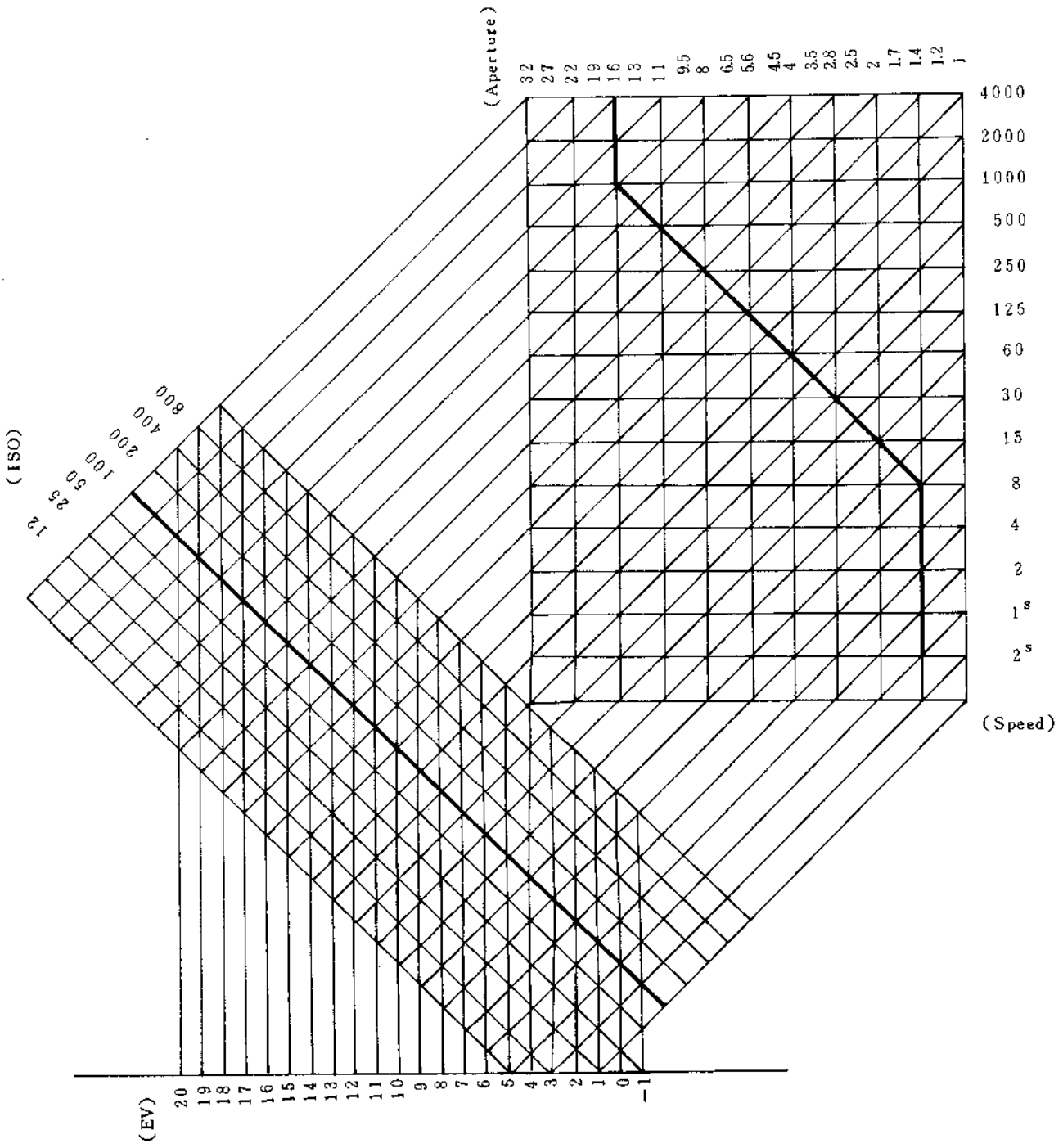


Fig 81

Normal Program (P) AE Control Scale

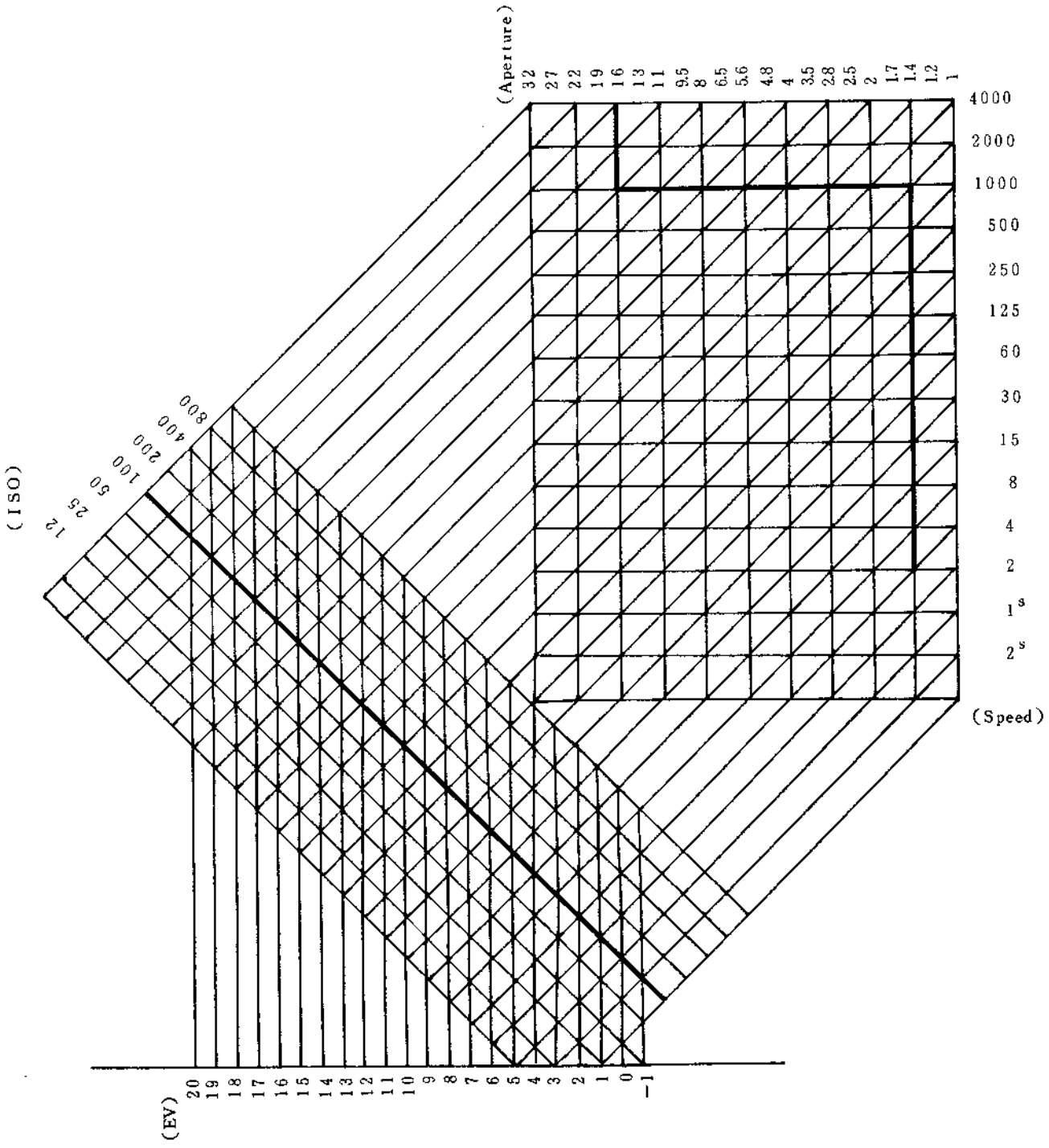
(F1.4 lens : set at F16)



High-speed Program (HP) AE Control Scale

(F1.4 lens:set at F16)

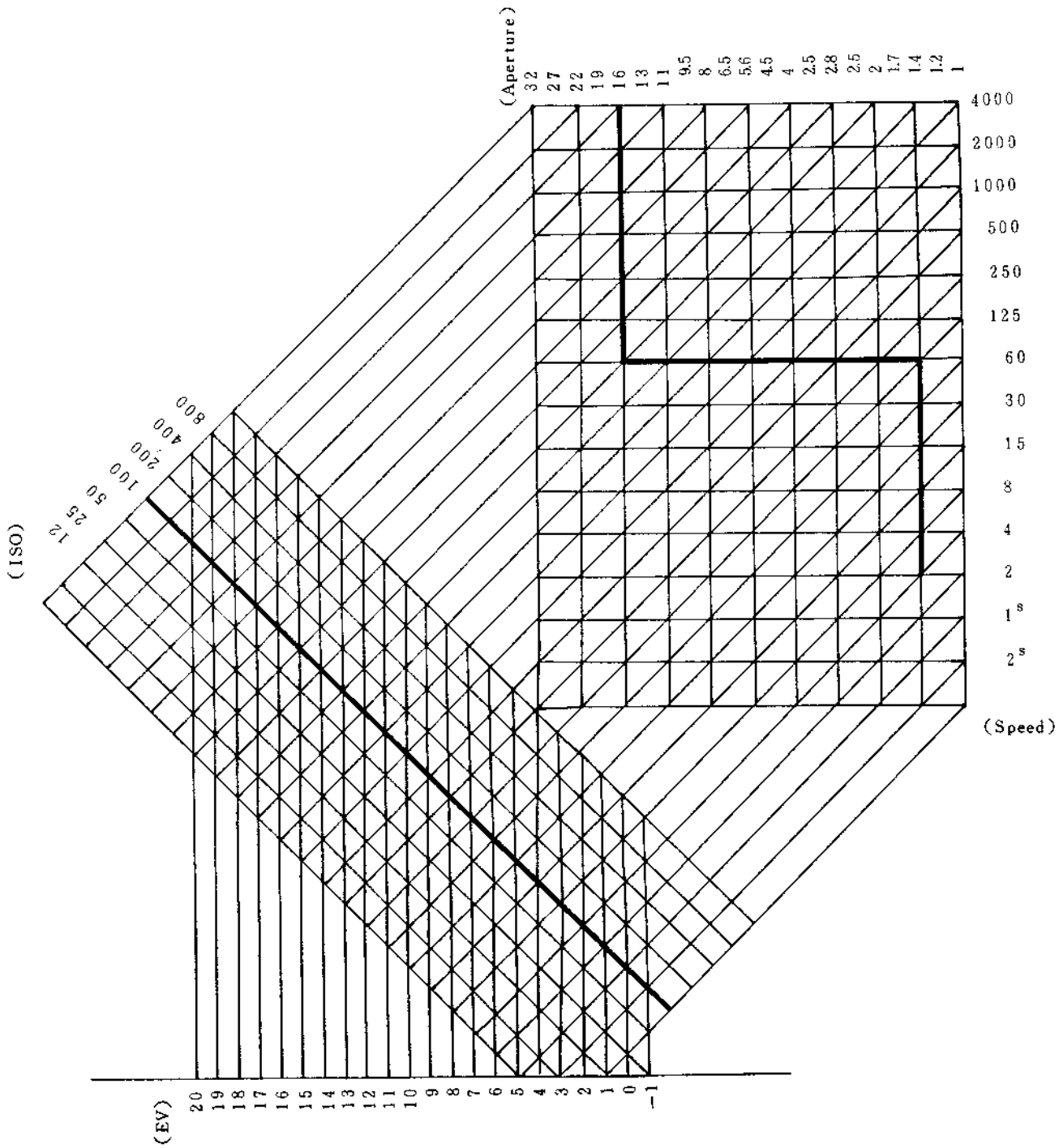
When the matching aperture is within the working shutter speed range of 1/1000 sec. in the High-speed Program, the shutter speed LEDs will pulsate at the respective shutter.

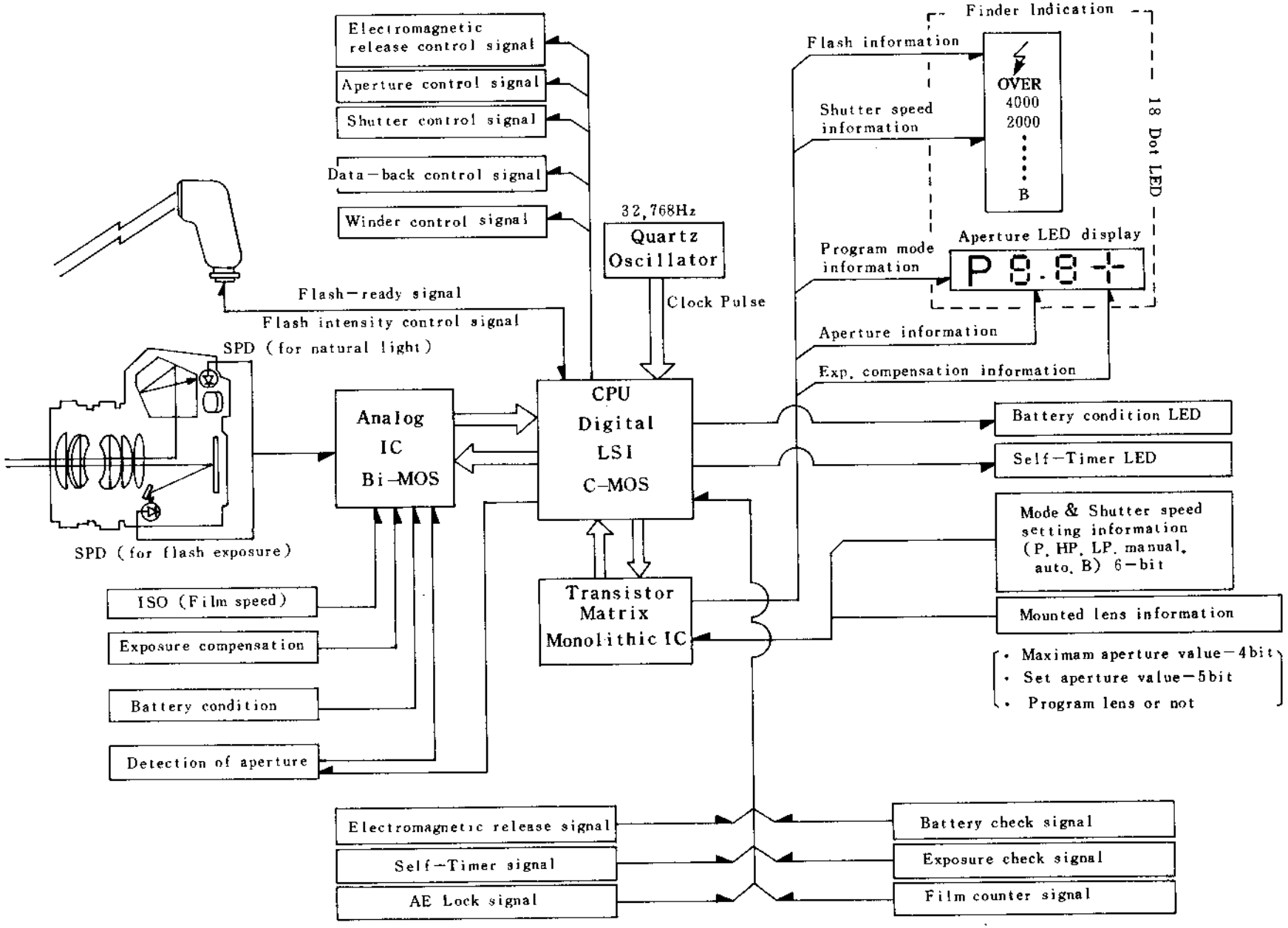


Low-speed Program (LP) AE Control Scale

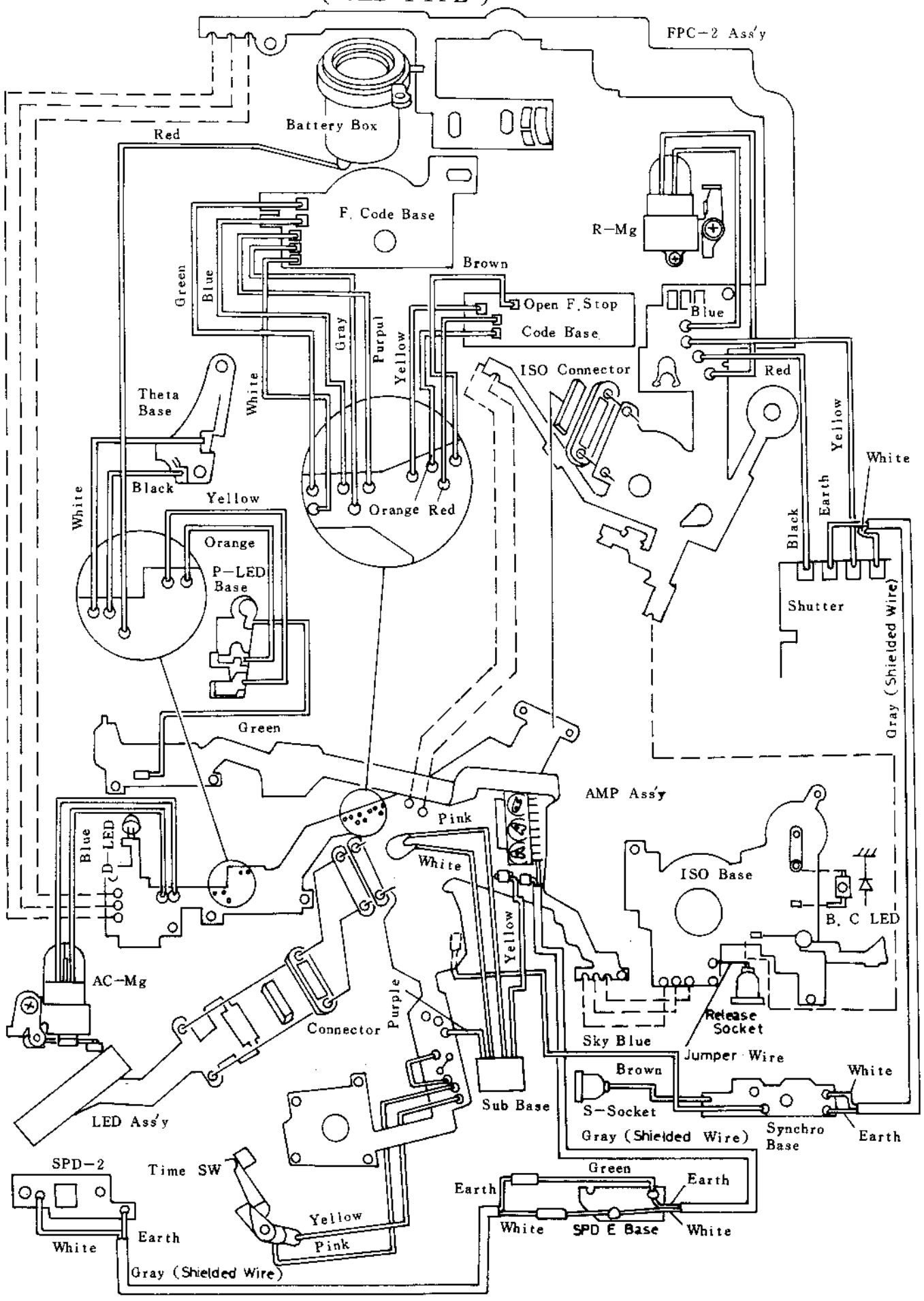
(F1.4 lens:set at F16)

When the matching aperture is within the working shutter speed range of 1/60 sec.in the Low-speed Program, the shutter speed LEDs will pulsate at the respective Shutter speeds.

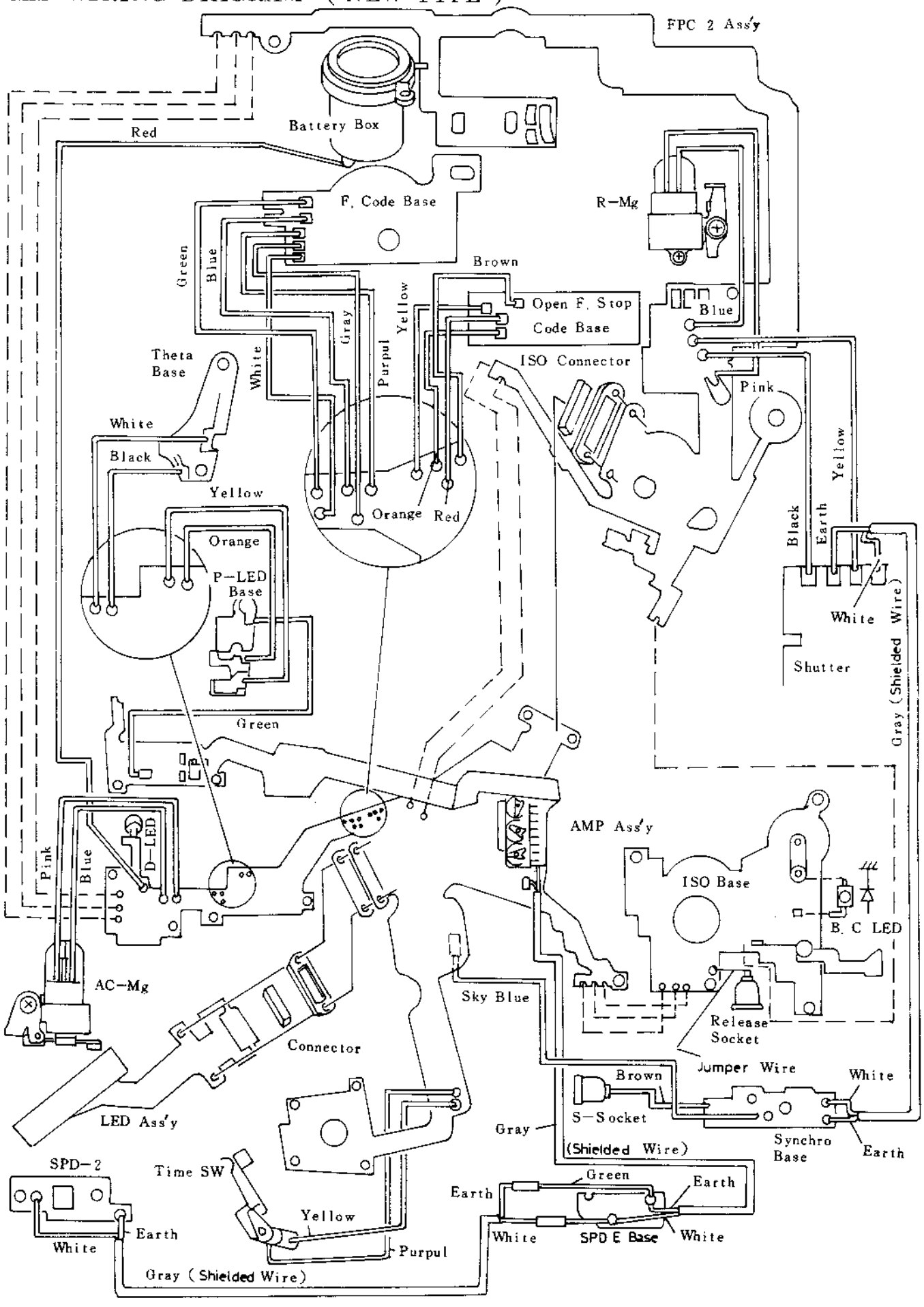



Electromagnetic release control signal
Aperture control signal
Shutter control signal
Data-back control signal
Winder control signal
32,768Hz
Quartz Oscillator
Clock Pulse
Finder Indication
Flash information
Shutter speed information
OVER
4000
2000
B
18 Dot LED
Aperture LED display
Program mode information
P 9.8
Flash-ready signal
Flash intensity control signal
SPD (for natural light)
Aperture information
Exp. compensation information
Analog IC Bi-MOS
CPU Digital LSI C-MOS
Battery condition LED
Self-Timer LED
Mode & Shutter speed setting information (P, HP, LP, manual, auto, B) 6-bit
Mounted lens information
• Maximam aperture value-4bit
• Set aperture value-5bit
• Program lens or not
SPD (for flash exposure)
ISO (Film speed)
Exposure compensation
Battery condition
Detection of aperture
Transistor Matrix Monolithic IC
Electromagnetic release signal
Self-Timer signal
AE Lock signal
Battery check signal
Exposure check signal
Film counter signal

159 MM WIRING DIAGRAM (OLD TYPE)



159 MM WIRING DIAGRAM (NEW TYPE)



9. MALFUNCTION AND CAUSES.

Note :
D-LED=Data Back LED
S-LED=Shutter speed LED

1 Shutter does not operate.

1-1) Shutter does not operate, but D-LED lights momentarily.

(1) Bad soldering of Red and Blue lead wires (from R-Mg)
(2) Defective of R-Mg
(3) Bad soldering of R2, defective of R2.
(4) Bad soldering of Tr3, defective of Tr3.
(5) Bad soldering of C2, defective of C2.

1-2) Shutter does not operate, S-LED light but D-LED does not light.

(1) Malcontact of W.Obstruction Lever contact (A01631)
(2) The W.Obstruction Lever malfunctions and W.Obstruction Lever can not be switch.
(3) Malcontact of Trigger Switch.
(4) Fallure of ISO Elastic Connector (159530)

1 EJ1 (Exp. compensation (+))
2 EJ2 (Exp. compensation (-))
3 Release
4 Check SW
5 B.C LED
6 FCT
7 AE Lock SW
8 Self (EI)
9 B.C SW
10 Self SW
11 Trigger SW
12 SM OUT (ST Mg)

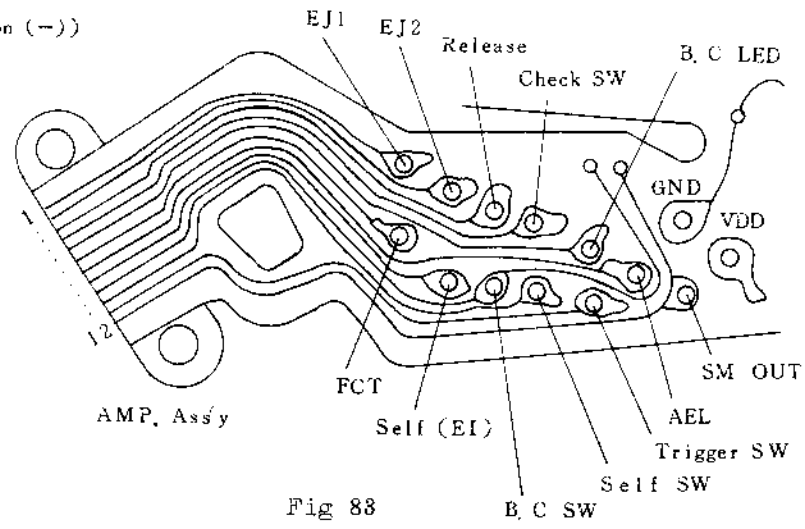


Fig 88

(5) Bad soldering of IC2 terminal #32.
(6) Defective of R6 (R6 is printed to the ISO resistor Base.)
(7) Bad soldering of Tr4, defective Tr4.
(8) Defective of AC Base Plate Ass'y.
(9) Defective of Winding, Shutter and Mirror Box mechanism.

1-3) Shutter does not operate and S-LED, D-LED do not light.

(1) Bad soldering of Red lead wire (from the Battery Case).
(2) Bad soldering of soldering point of FPC-2 and Battery Contact.
(3) Rivet on contact plate of Battery Case is loose.
(4) Bad soldering of soldering point of AMP Ass'y and FPC-2 at the bottom of the camera body.

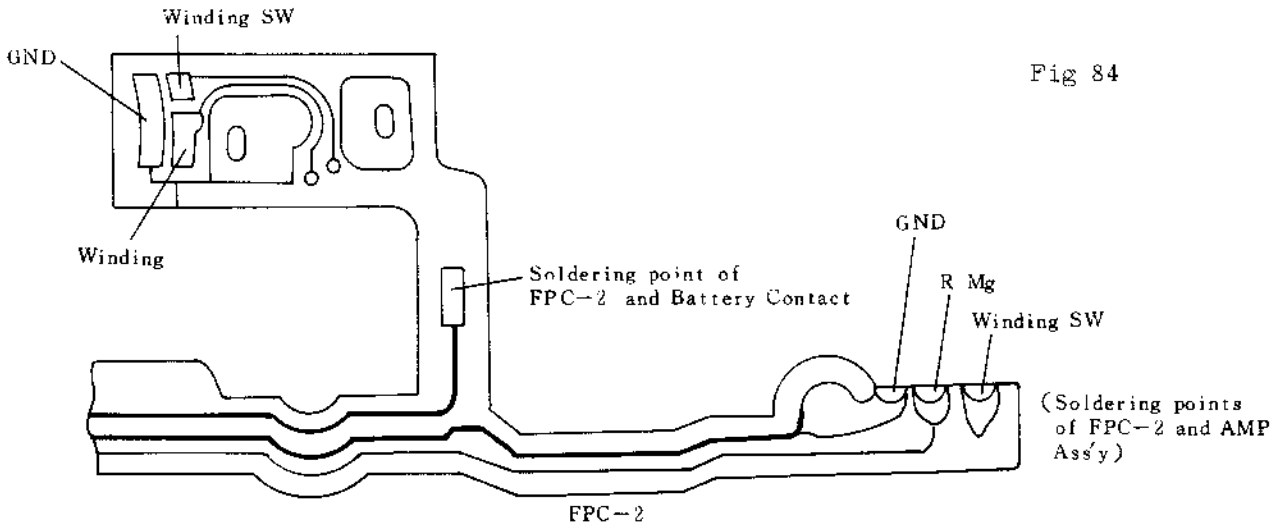


Fig 84

(5) P.S Switch (152520) is dirty·····Clean the ISO resistor Base and P.S Switch or replace the P.S Switch.
(6) Bad soldering of X'tal, defective of X'tal.
(7) Bad soldering of C6 and C7, defective of C6 and C7.
(8) Bad soldering of Tr6, defective of Tr6.
(9) Bad soldering of IC-2 terminal #2, #3, #14, #21 and #24.

1-4) Shutter does not operate and short circuit.

(1) Short circuit of Top Cover and Time Switch (159363).
(2) Short circuit of camera body and Red lead wire (from the Battery case) at the bottom of the camera body.
(3) Short circuit of camera body and Pink and Blue (from the AC Mg) at the bottom of the camera body.
(4) Short circuit of contact (+) of Battery Case and Lead Wire Fixer (068087) located under the AC Base Plate Ass'y.
(5) Short circuit of Shielded wire (from Shutter) and SPD Guard (L) (159845) when Top Cover is mounted.
(6) Short circuit of camera body and Shielded wire (from SPD-2 Base) as shown in (Fjg 85).

※ Forming of Shielded wires

Form the Shielded wires as shown below.

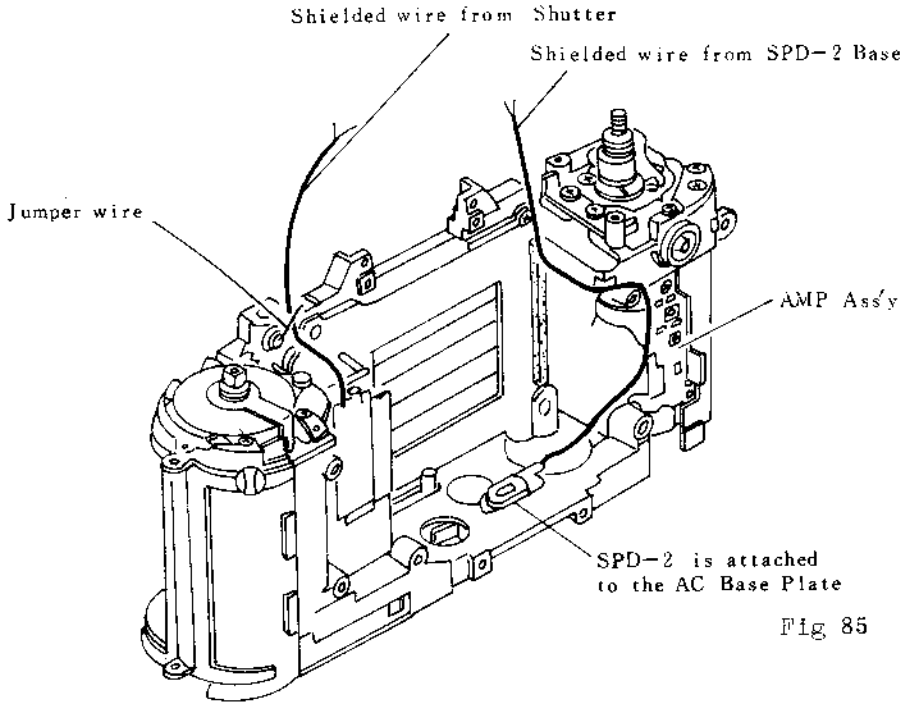


Fig 85

1-5) Shutter does not operate with the W-7 Winder.

(Before starting repair, check the W-7 Winder thoroughly).

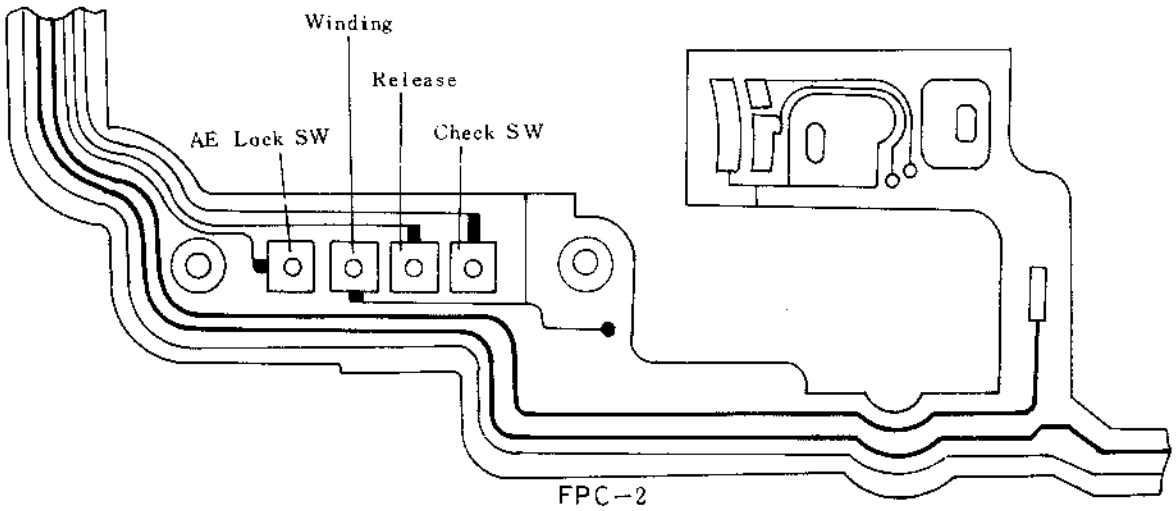
(1) Malcontact of W.Obstruction Lever contact.

(2) Malcontact of Terminal Pin (260174) of W-7 and Connector Pin (159196).

(3) Pattern of FPC-2 is dirty as shown below.

(4) Bad soldering of soldering point of AMP Ass'y and FPC-2 as Shown in (Fig 84).

Fig 86



2 Shutter trips itself after winding.

2-1) Shutter trips itself after winding

(1) Jumper wire of Release Socket is grounded to the camera body.
(2) MCL - 8 does not move smoothly.

2-2) Mirror remains flipped up when winding.

(1) Improper adjustment of R Mg hook and MCL - 2.
(2) Foreign object lodged in R Mg.
(3) R Mg hook spring has slipped out of the position.
(4) R Mg Movable Plate Lever Spring has slipped out of the position.
(5) Improper fitting of R Mg hook and MCL - 2 ..... Replace the R Mg.
(6) R Mg Set Screws (66001050×2) is loose.
(7) ACL - 1 Spring (2) (159819) has broken.

3 FCT (Blank Exposure) does not operate.

3-1) FCT does not operate.

(1) FCT Switch Spring (159854) has slipped out of the posision.
(2) Bad soldering of FCT Switch Spring.
(3) Malcontact of FCT Switch and FCT Switch Plate.
(4) Rivet on FCT Switch is loose.
(5) Fallure of the ISO Elastic Connector.
(6) Short circuit of FD Mirror Holder Ass'y (A01841) and Base of LED Ass'y (1/250 does not light).
(7) Bad soldering of IC - 2 terminal #15.

4 Incorrect Shutter Speed.

4-1) Shutter runs but does not open at all modes.
(The film is not exposed occasionally or always).

(1) Bad soldering of Black lead wire (form Shutter Mg).
(2) Bad soldering of wire of Shutter Mg.
(3) Defective of Shutter Mg.
(4) Fallure of ISO Elastic Connector.
(5) Bad soldering of Tr5 (collector), defective of Tr5.
(6) Bad soldering of R14, defective of R14.
(7) Bad soldering of IC - 2 terminal #22.

4-2) Shutter remains open.

(1) Trigger Switch is kept " ON "
(2) Defective of Tr5 (short circuit between Tr5 emitter and base).

4-3) Shutter speed is incorrect.

(1) Time Switch is kept " ON "
(2) Improper adjustment of Trigger Switch.

4-4) Shutter speed is incorrect and the S-LED in wrong position.

(1) Improper contact of S.Click Plate Ass'y (A01345).
(2) Bad soldering of IC-3 terminal #37 ~ #41.

4-5) Shutter speed is not stable.

(1) Rivet on Trigger Switch is loose.
(2) Defective of Shutter.

5 AUTO Exposure is incorrect.

5-1) Extemely under-exposed, and " OVER " LED remains lit.

(1) Malcontact of ISO Contact Base Ass'y (A01303)
(2) Malcontact of Aperture Code Contact as shown in (Fig 22)
(3) Bad soldering of White, Grey, Purple, Blue and Green lead wires (from Aperture Code Base Ass'y).
(4) Short circuit of S.Click Plate contact.
(5) Bad soldering of Ra3-1.
(6) Bad soldering of C8, defective of C8.
(7) Bad soldering of R11, defective of R11.

5-2) Extemely over-exposed, and " B " LED remains lit.

(1) Malcontact of Ra1.
(2) Bad soldering of ISO Resistor Base and FPC-2.
(3) Bad soldering of White, Grey, Purple, Blue and Green lead wires (from Aperture Code Base Ass'y).
(4) Short circuit of Top Cover and Vr1 as shown in (Fig 59).
(5) Short circuit of camera body and Orange lead wire.(Orange lead wire is soldered to old type of AMP Ass' y)
(6) Bad soldering of C12, defective of C12.
(7) Bad soldering of SPD-1.

5-3) Incorrect Auto-exposure.

(1) Standard voltage is incorrect. (adj. Ra3-2 to 720mV).
(2) Offset voltage is incorrect. (adj. Ra3-1 to 3 ~ 7mV).
(3) Defective of ISO Resistor Base.
(4) Time Switch is kept " ON " (Shutter speed is incorrect).
(5) Leak of SPD-1.

6 Program Exposure is incorrect.

6-1) Program exposure is incorrect.

(1) Bad soldering of Green, Yellow, Orange lead wires (from P-LED Base) and Black, White lead wires (from Theta Base).
(2) Short circuit of camera body and Red, Blue lead wires (from AC-Mg).
(3) Bad soldering of Red, Blue lead wires (from AC-Mg).
(4) Defective of AC-Mg.
(5) Lack of AC-Mg adjust screw grease as shown in (Fig 17).
(6) ACL-3 does not move smoothly.
(7) Theta Base Set Screws (61912026) (159706) are loose.
(8) Defective of Photo Coupler Ass'y (A01597).
(9) Bad soldering of Tr1, defective of Tr1.
(10) Bad soldering of Tr2, defective of Tr2.
(11) Bad soldering of Tr7, defective of Tr7.
(12) Bad soldering of R3, defective of R3.
(13) Bad soldering of R4, defective of R4.
(14) Bad soldering of C1, defective of C1.
(15) Bad soldering of IC-1 terminal #32.
(16) Bad soldering of IC-2 terminal #30, #31.
(17) Defective of AC Base Plate Ass'y (A01708).

6-2) Incorrect Program exposure for Auto exposure.

(1) Bad soldering of Jumper wire of AJ2, GND, AJ1 as shown in (Fig 79) (Fig 80).
(2) Improper soldering of Black and White lead wires (from Theta Base).
(3) AC Claw does not move smoothly as shown in (Fig 17). (Defective of delayed pulse).
(4) The AC Ratchet Wheel is moving when slowly set the ACL-1 Ass'y and QRL-5 Ass'y.
(5) Defective of AC Base Plate Ass'y (A01708).
(6) Bad soldering of IC-2 terminal #5.

6-3) Always Program mode when using an older type lens without the program coupling pin.

(1) Short circuit of Black, and white lead wires (from Theta Base).

7 Defective flash photography. (With TLA flash unit).

7-1) Shutter speed does not change to the sync. speed after flash is charged.

(1) Shoe spring on Synchro Base does not connect properly to the Top Cover.
(2) Bad soldering of R9, defective of R9.

7-2) Does not regulate the Flash out put.

(1) Bad soldering Shielded wire (from SPD 2 Base).
(2) Bad soldering Shielded wire (from Shutter).
(3) Defective of Shoe Contact Plate (1) Ass'y (139174) and shoe Contact Ass'y (065461) of Top Cover.
(4) Shoe Spring on Synchro Base does not connect properly to the Top Cover.
(5) Bad soldering of Ra2.
(6) Bad soldering Sky Blue to Synchro Base.
(7) Bad soldering of SPD-2.
(8) Ra2 is re-adjusted.
(9) Bad soldering of C11, defective of C11.
(10) Bad soldering of R17, defective of R17.
(11) Bad soldering of R18, defective of R18.
(12) Leack of SPD-2.

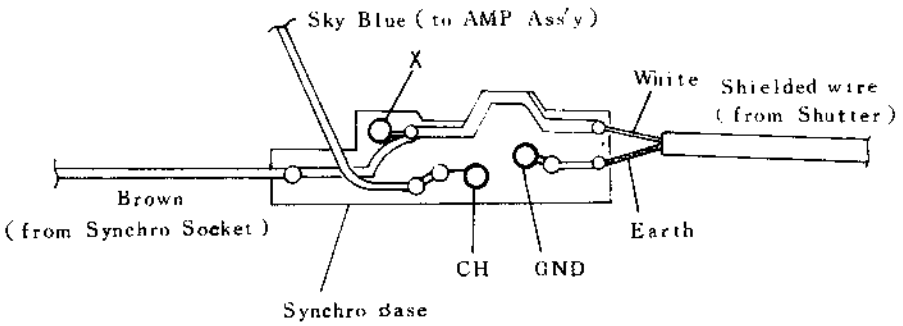


Fig87

8 Defective Viewfinder Display.

8-1) Shutter dial and Shutter LED do not interlock.

(1) Malcontact of S.Click Base Contact.
(2) Bad soldering of IC-3 terminal #10 ~ #15 and #37 ~ #41.

8-2) Shutter LED does not light. (B ~ OVER or ⚡)

(1) Defective of LED Ass'y (159510)
(2) Fallure of Elastic Connector (141540)
(3) Short circuit of FD Mirror Holder Ass'y and Base of LED Ass'y.
(4) Bad soldering of R13, defective of R13.(⚡ LED does not light).

8-3) Shutter LED remains lit, more than two LEDs light at the same time, or wrong indication of Shutter LED.

(1) Defective of LED Ass'y (159510)
(2) Short circuit of FD Mirror Holder Ass'y and Base of LED Ass'y.
(3) Misassemly Release Switch Washer.(159316).(S- LED continuously lights up).

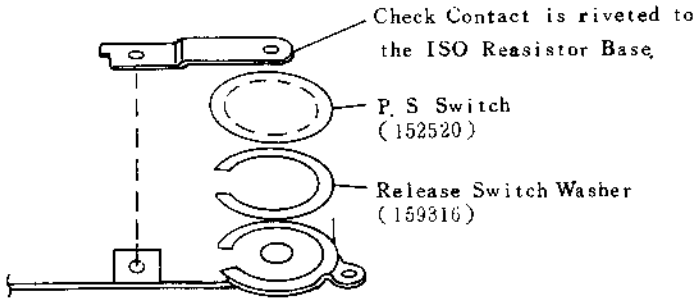


Fig 88

(4) Malcontact of S.Click Base Contact.
(5) S.Base Set Screw (63912022) is loose.
(Four LEDs light at the same time when shutter is released).
(6) FPC Cover (159106) part missing (B LED remains lit)
(7) Acetate Cloth Tape part missing as shown in (Fig 10).
(B LED remains lit).
(8) Short circuit of Top Cover and Vr1 as shown in (Fig 59).
(9) Fallure of Elastic Connector (141540).
(10) Leack of SPD-1.
(11) Bad soldering of R11, defective of R11.
(12) Bad soldering of R16, defective of R16.

8-4) Wrong indication of Aperture display

(1) Defective of LED Ass'y.
(2) Short circuit of FD Mirror Holder Ass'y and Base of LED Ass'y.
(3) Fallure of Elastic Connector (141540).
(4) Malcontact of Aperture Code Contact as shown in (Fig 22).
(5) Bad soldering of Green, Blue, White, Purpul and Grey lead wires (from F.Code Base).
(6) Aperture Code Base Set Screw (63912522) (GND) is loose.
(7) Bad soldering of IC-2 and IC-3 terminal.

8-5) Wrong indication of Program AE mode display.

(1) Defective of LED Ass'y.
(2) Theta Base Set Screws (61912026) (159706) are loose.
(3) Bad soldering of White lead wire (from Theta Base).
(4) Fallure of Elastic Connector (141540).
(5) Short circuit of IC-2 terminal #13 and #14. (P.remain lit)
(6) Bad soldering of IC-2 and IC-3 terminal.

8-6) Wrong indication of Exposur compensation display.

(1) Defective of LED Ass'y
(2) Short circuit of FD Mirror Holder Ass'y and Base of LED Ass'y.
(3) Fallure of Elastic Connector.
(4) Bad soldering of FPC-2 and ISO Resistor Base EJ1, EJ2 as shown in (Fig 91).
(5) Bad soldering of IC-3 terminal #18.
(6) Short circuit of IC-3 terminal #7 and #8.

9 AE-Lock does not work.

(1) Malcontact of AE Lock Contact (159208)
(2) Fallure of ISO Elastic Connector.
(3) Bad soldering of IC-2 terminal #18.

10 Self－timer does not work properly.

※ The self-timer will not function when the Shutter control dial is set at " B ".

10－1) Self－timer does not work or can not cancel.

(1) Malcontact of Self contact.
(2) Defective of Self－timer Base Ass'y (A01245).
(3) Fallure of ISO Elastic Connector.
(4) Bad soldering of IC－2 terminal #19.

10－2) Self－timer LED does not light.

(1) Malcontact of Self contact.
(2) Bad soldering of Self LED, defective of Self LED.
(3) Bad soldering of IC－2 terminal #20.

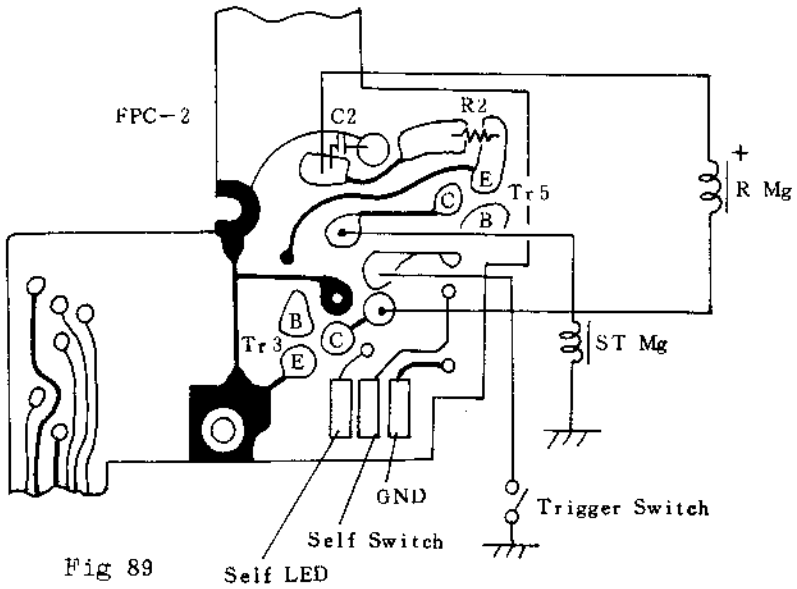


Fig 89

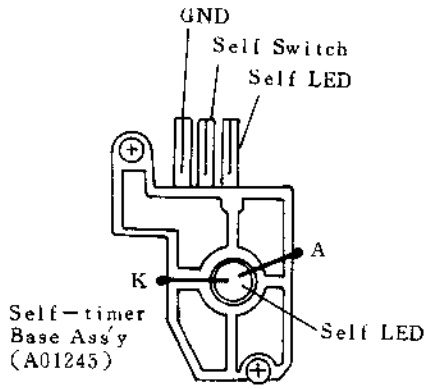


Fig 90

11 VA－VS (180mV) Voltage can not be adjusted.

(1) Malcontact of ISO Contact Base Ass' y (A01303).
(2) Short circuit of soldering points of FPC－2 and ISO Resistor Base Ass'y.
(3) Defective of ISO Resistor Base Ass'y.

12 Battery check LED does not light.

(1) Bad soldering of Battery check LED (352522), defective of Battery check LED.

(2) Bad soldering of R8, defective of R8.

(3) Bad soldering of soldering point of FPC-2 and ISO Resistor Base Ass'y.

(4) Malcontact of Main Switch Plate Ass'y (A01214)

(5) Bad soldering of IC-2 terminal #33, #34.

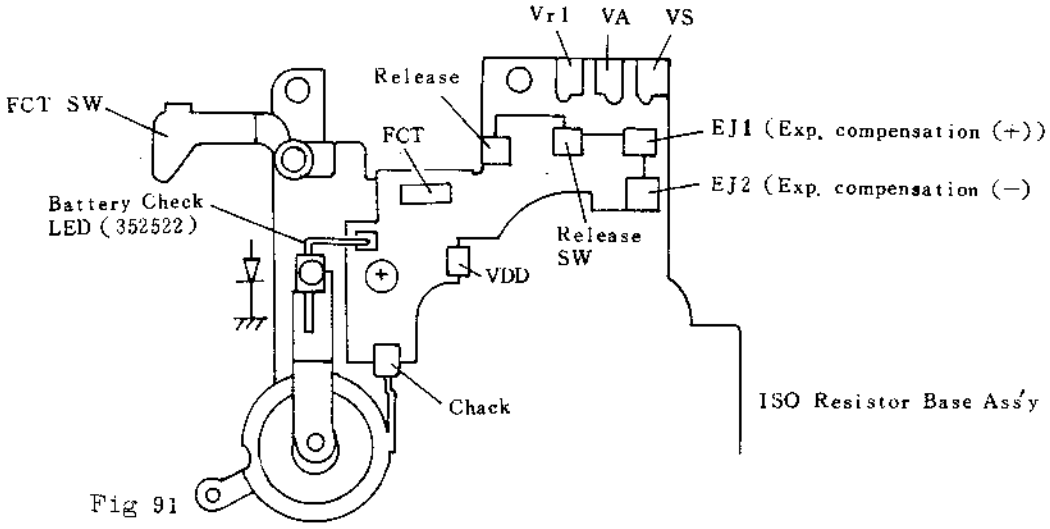
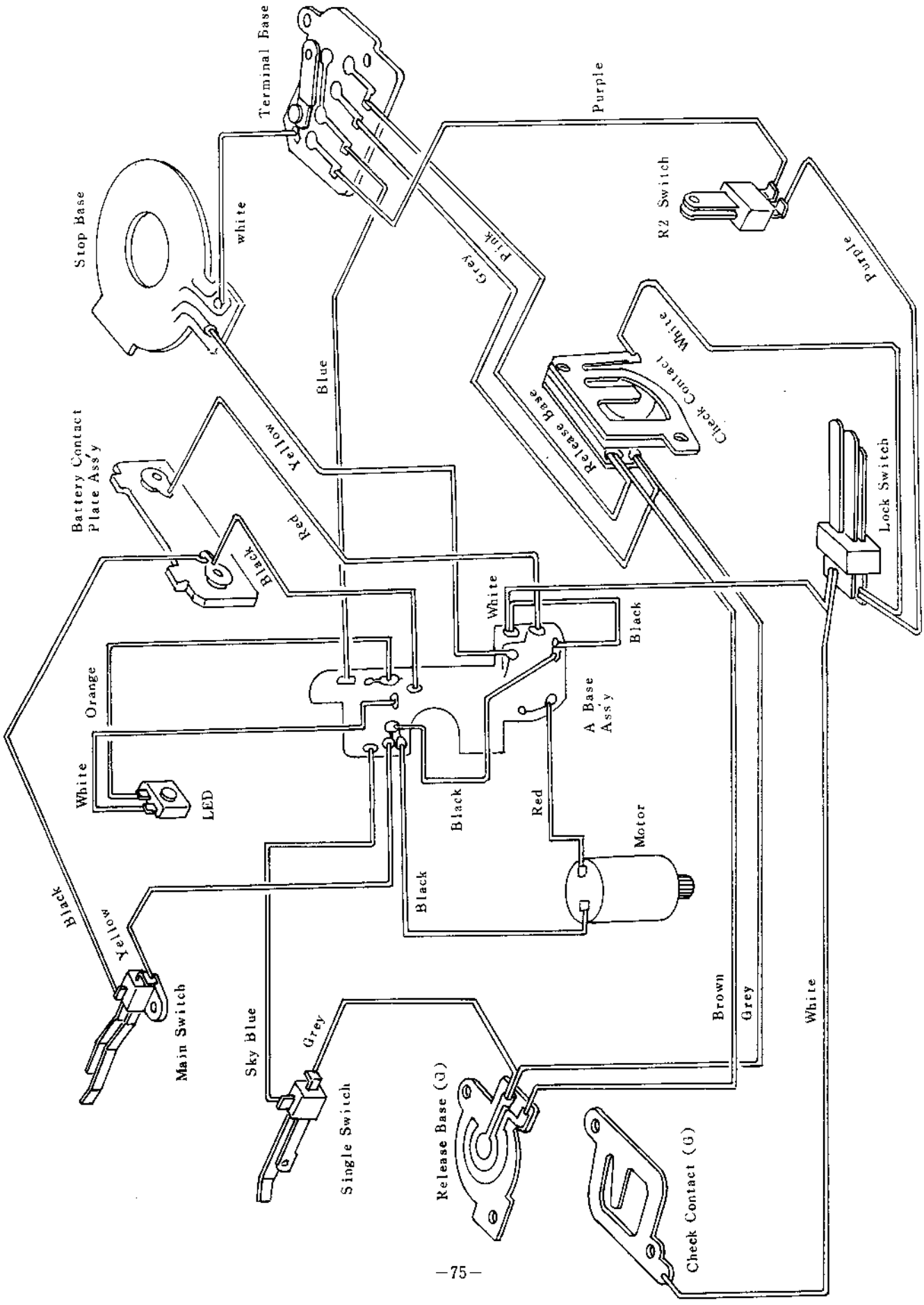


Fig 91

W—7 WINDER WIRING DIAGRAM